



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

UC-NRLF



\$B 229 126



THE LIBRARY
OF
THE UNIVERSITY
OF CALIFORNIA
DAVIS

inn. soc. society.

Report - 1887.

15

UNIVERSITY OF MICHIGAN
LIBRARY
EAST LANSING
MICHIGAN 48824



Marshall P. Wilder

ANNUAL REPORT
OF THE
MINNESOTA STATE
HORTICULTURAL SOCIETY,

FOR THE YEAR 1887,

EMBRACING THE

TRANSACTIONS OF THE SOCIETY FROM MARCH 31, 1886, to MARCH 31, 1887;
ALSO PROCEEDINGS OF THE ANNUAL MEETING OF THE
MINNESOTA AMBER CANE ASSOCIATION,
ESSAYS, REPORTS, ETC.

VOL. XV.



UNIVERSITY OF CALIFORNIA
LIBRARY
BRANCH OF THE
COLLEGE OF AGRICULTURE

Prepared by the Secretary, S. D. HILLMAN, Minneapolis, Minn.

ST. PAUL, MINN.:
THE PIONEER PRESS COMPANY.
1887.

LIBRARY
UNIVERSITY OF CALIFORNIA
DAVIS

LETTER OF TRANSMITTAL TO THE GOVERNOR.

OFFICE OF THE SECRETARY,
MINNEAPOLIS, March 30, 1887. }

To Hon. A. R. McGill, Governor of Minnesota:

SIR: I have the honor to submit herewith, in compliance with legal requisition, the accompanying report for 1887, with supplementary papers.

Respectfully yours,

S. D. HILLMAN,
Secretary Minnesota State Horticultural Society.

TABLE OF CONTENTS.

OFFICERS FOR 1887.....	4
GENERAL FRUIT COMMITTEE.....	5
SUPERINTENDENTS OF EXPERIMENTAL STATIONS.....	5
STANDING COMMITTEES.....	6
MEMBERS—	
Annual.....	8
Honorary for Five Years.....	10
Honorary Life Members.....	11
OFFICERS STATE AGRICULTURAL SOCIETY.....	12
CONSTITUTION	13
PROCEEDINGS OF THE SUMMER MEETING	17
PROCEEDINGS OF THE TWENTIETH ANNUAL MEETING....	43, 189
PROCEEDINGS OF THE MINNESOTA AMBER CANE ASSOCIA'N	161
SECRETARY'S PORTFOLIO—	
Report of Delegates to Wisconsin.....	426
Local Horticultural Societies.....	434
Fruit Growing in the Northwest.....	449
Horticulture at Southern Minnesota Fair.....	452
Russian Apples.....	454
Protecting and Pruning Grape Vines	455
How to Eat Strawberries	457
Resolutions on Forestry.....	460
Laws Relating to Horticulture.....	424, 461
Weedy Plants and their Dissemination.....	469
General Index.....	487

OFFICERS AND MEMBERS FOR 1887.

PRESIDENT.

WYMAN ELLIOT.....Minneapolis.

VICE PRESIDENTS.

A. W. SIAS.....Rochester.

E. H. S. DARTT.....Owatonna.

M. CUTLER.....Sumter.

N. J. STUBBS.....Long Lake.

G. W. FULLER.....Litchfield.

SECRETARY.

S. D. HILLMAN.....Minneapolis.

TREASURER.

J. T. GRIMES.....Minneapolis.

EXECUTIVE COMMITTEE.

The President, Secretary and Treasurer *ex-officio* and

J. S. HARRIS, Chairman.....La Crescent.

J. M. UNDERWOODLake City.

F. G. GOULD.....Excelsior.

DITUS DAY.....Farmington.

ISAAC GILPATRICK.....Minneapolis.

ENTOMOLOGIST.

PROF. O. W. OESTLUND.....Minneapolis.

LIBRARIAN.

E. A. CUZNER.....College of Agriculture, Minneapolis.

SUPERINTENDENTS OF EXPERIMENTAL STATIONS.

PROF. EDWARD D. PORTER.....	University Farm, St. Anthony Park.
PETER M. GIDEON.....	Excelsior.
M. PEARCE.....	Minneapolis.
G. W. FULLER.....	Litchfield.
A. W. SIAS.....	Rochester.
R. M. PROBSTFIELD.....	Moorhead.
F. J. SCHREIBER.....	Moorhead.
ANDREW PETERSON.....	Waconia.
CHARLES LUEDLOFF.....	Carver.
UNDERWOOD & EMERY.....	Lake City.
B. TAYLOR.....	Forestville.
FRED VON BAUMBACH.....	Alexandria.
E. H. S. DARTT.....	Owatonna.
L. E. DAY.....	Farmington.
J. S. HARRIS.....	La Crescent.
O. M. LORD.....	Minnesota City.

GENERAL FRUIT COMMITTEE.

SIDNEY CORP.....	Hammond.
D. K. MICHENOR.....	Etna.
J. C. KRAMER.....	La Crescent.
O. E. SAUNDERS.....	Granite Falls.
O. F. NORWOOD.....	Balaton, Murray county.
M. C. BUNNELL.....	Newport.
N. J. STUBBS.....	Long Lake.
WILLIAM MCHENRY.....	St. Charles.
O. M. LORD.....	Minnesota City.
CLARENCE WEDGE.....	Albert Lea.
GEORGE E. CASE.....	St. Peter.
M. CUTLER.....	Sumter.
G. W. FULLER.....	Litchfield.
L. E. DAY.....	Farmington.
CHARLES LUEDLOFF.....	Carver.
W. E. BRIMHALL.....	St. Paul.
M. T. DUNCAN.....	Fergus Falls.
J. H. LUDLOW.....	Worthington.

* The members of the General Fruit Committee are expected to report separately on all matters of interest in horticulture, but more especially to bring to the notice of the Society new and improved fruits.

COMMITTEE ON LEGISLATION.

WYMAN ELLIOT.....	Minneapolis.
PROF. E. D. PORTER.....	St. Anthony Park.
J. T. GRIMES.....	Minneapolis.

COMMITTEE ON SEEDLING FRUITS.

J. S. HARRIS.....	La Crescent.
A. W. SIAS.....	Rochester.
G. W. FULLER.....	Litchfield.

COMMITTEE ON APPLES, PEARS AND PLUMS.

J. S. HARRIS.....	La Crescent.
CHAS. A. KEFFER.....	Minneapolis.
ISAAC GILPATRICK.....	Minneapolis.

COMMITTEE ON NATIVE FRUITS.

O. M. LORD.....	Minnesota City.
J. S. HARRIS.....	La Crescent.
J. O. BARRETT.....	Browns Valley.

COMMITTEE ON RUSSIAN APPLES.

CHARLES LUEDLOFF.....	Carver.
A. W. SIAS.....	Rochester.
A. PETERSON.....	Waconia.

COMMITTEE ON GRAPES AND SEEDLINGS.

T. BOST.....	Excelsior.
M. PEARCE.....	Minneapolis.
A. W. LATHAM.....	Excelsior.

COMMITTEE ON EXPLORATION FRUITS AND FLOWERS.

PROF. E. D. PORTER.....	St. Anthony Park.
S. D. HILLMAN.....	Minneapolis.
A. W. SIAS.....	Rochester.

COMMITTEE ON FORESTRY.

C. L. SMITH.....	Minneapolis.
J. W. BOXELL.....	St. Paul.
M. CUTLER.....	Sumter.

COMMITTEE ON EVERGREENS.

J. T. GRIMES.....	Minneapolis.
O. F. BRAND.....	Faribault.
H. R. HUNTER.....	Sioux Falls, Dak.

COMMITTEE ON DECIDUOUS TREES AND SHRUBS.

PROF. D. R. MAGINNIS	St. Paul.
S. M. EMERY	Lake City.
M. J. HOAG	Rochester.

COMMITTEE ON FRUIT BLOSSOMS.

PROF. E. D. PORTER	St. Anthony Park.
GEO. P. PEFFER	Pewaukee, Wis.
J. S. HARRIS	La Crescent.

COMMITTEE ON GREENHOUSES AND HOTBEDS.

R. J. MENDENHALL	Minneapolis.
E. A. CUZNER	Agricultural College, Minneapolis.
SMITH & DARLING	Winona.

COMMITTEE ON FLORICULTURE.

MRS. C. O. VAN CLEVE	Minneapolis.
MRS. F. G. GOULD	Excelsior.
MRS. ANNA B. UNDERWOOD	Lake City.

COMMITTEE ON NOMENCLATURE.

E. H. S. DAETT	Owatonna.
A. W. LATHAM	Excelsior.
O. F. BRAND	Faribault.

COMMITTEE ON SMALL FRUITS.

PROF. L. ASIRE	Minneapolis.
F. G. GOULD	Excelsior.
E. M. CHANDLER	Minneapolis.

COMMITTEE ON VEGETABLE GARDENING.

WILLIAM LYONS	Minneapolis.
JOSIAH ALLEN	Red Wing.
WILLIAM H. BRIMHALL	St. Paul.

COMMITTEE ON MARKETING AND NEW HORTICULTURAL APPLIANCES.

F. G. GOULD	Excelsior.
WILLIAM H. BRIMHALL	St. Paul.
N. J. STUBBS	Long Lake.

COMMITTEE ON HONEY AND SYRUP.

J. G. BASS	St. Anthony Park.
L. E. DAY	Farlington.
SETH H. KENNEY	Morristown.

COMMITTEE ON BREAD AND CAKE.

MRS. WILLIAM H. BRIMHALL.....	St. Paul.
MISS M. ESTELLE PORTER.....	St. Anthony Park.
MISS MARY GRIMES	Minneapolis.

COMMITTEE ON PICKLES, PRESERVES AND
CANNED GOODS.

MRS. E. J. STAGER.....	Sauk Rapids.
MRS. O. C. GREGG.....	Minneapolis.
MISS M. LYONS.....	Minneapolis.

COMMITTEE ON ENTOMOLOGY.

PROF. O. W. OESTLUND.....	Minneapolis.
R. J. MENDENHALL.....	Minneapolis.
J. S. HARRIS.....	La Crescent.

ANNUAL MEMBERS.

ACKERMAN, J. H.....	Young America.
ALLEN, JOSHUA.....	Red Wing.
ARMOUR, MAGWOOD.....	Stonewall, Man.
ARNOLD, JAMES.....	Hammond.
BARRETT, J. O.....	Browns Valley.
BOXELL, J. W.....	St. Paul.
BLAKELEY, CAPT. RUSSELL.....	St. Paul.
BOST, T.....	Excelsior.
BRAND, O. F.....	Faribault.
BRIMHALL, WM. H.....	St. Paul.
BROWN, A. L.....	Brownton.
BROWN, C. F.....	St. Peter.
BUNNELL, M. C.....	Newport.
BUSCH, FRED.....	Richfield.
BUSH, A. K.....	Dover.
BUSSE, H. F.....	Minneapolis.
CANNON, WILLIAM.....	Fort Abraham Lincoln, Dak.
CHANDLER, E. M.....	Minneapolis.
COMBS, WM. S.....	St. Paul.
COOK, DE WAINE.....	Windom.
COOK, M. W.....	Rochester.
CORLETT, JOHN E.....	Farmersburg, Iowa.
CORP, SIDNEY.....	Hammond.
CRAWFORD, MATHEW.....	Cuyahoga Falls, Ohio.
CROSBY, HON. F. M.....	Hastings.
CROSS, MRS. E.....	Sauk Rapids.
CUTLER, MILON.....	Sumter.

CUZNER, E. A.....	Minneapolis.
DANFORTH, WILLIAM.....	Red Wing.
DARTT, E. H. S.....	Owatonna.
DAY, DITUS.....	Farmington.
DAY, FRANK A.....	Fairmont.
DAY, L. E.....	Farmington.
DEVOL, W. S.....	Columbus, Ohio.
DOUGHTY, J. COLE.....	Lake City.
DWINNELL, R. C.....	Sumter.
EMERY, S. M.....	Lake City.
FRANKLAND, THOMAS.....	Stonewall, Man.
FULLER, G. W.....	Litchfield.
GILPATRICK, ISAAC.....	Minneapolis.
GOULD, F. G.....	Excelsior.
GREGG, O. C.....	Minneapolis.
GRIESE, C. H.....	Cleveland, Ohio.
HARRINGTON, GEO. W.....	Plainview.
HARRIS, EUGENE E.....	La Crescent.
HARRIS, FRANK I.....	La Crescent.
HILLMAN, S. D.....	Minneapolis.
HUBBARD, T. S.....	Fredonia, N. Y.
JACKSON, E. D.....	Minneapolis.
JEHU, GEORGE.....	Hastings.
JENKINS, J. W.....	Champlin.
KENNEY, SETH H.....	Morristown.
KNAPHEIDE, RUDOLPH.....	St. Paul.
KRAMER, J. C.....	La Crescent.
LABBITT, GEORGE.....	Lake City.
LATHAM, A. W.....	Excelsior.
LEAVENWORTH, FRANK H.....	Detroit, Mich.
LITTLE, JOHN.....	Granton, Ont.
LUEDLOFF, CHARLES.....	Carver.
LYONS, WILLIAM.....	Minneapolis.
MACKINTOSH, WILLIAM.....	Langdon.
MAGINNIS, PROF. D. R.....	St. Paul.
MENDENHALL, R. J.....	Minneapolis.
MCHEMRY, D. A.....	St. Charles.
MILLS, L. D.....	Garden City.
NOBEN, O. O.....	St. Cloud.
NOBLE, J.....	Sumter.
NORQUIST, JOHN.....	Red Wing.
OWEN, S. M.....	Minneapolis.

PARKER, W. L.....	Farmington.
PARTRIDGE, SAM.....	Moorhead.
PERKINS, WM. R.....	South Troy.
PETERSON, ANDREW.....	Waconia.
PORTER, PROF. EDWARD D.....	St. Anthony Park.
PRESTON, W. O.....	Luverne.
PUFFER, DR. F. L.....	Bird Island.
ROBERTS, AUSTIN J.....	Leandro, Cal.
ROGERS, GEORGE	Money Creek.
ROGERS, T. R.....	Red Wing.
RUNNING, S.....	Menomonie, Wis.
SALZER, JOHN A.....	La Crosse, Wis.
SELBIE, WILLIAM	Deadwood, Dak.
SHERREN, P. C.....	St. Paul.
SLACK, H. W.....	St. Paul.
SOLEM, ANDREW.. ..	Spink, Dak.
SOLEM, O. A. Th.....	Halstad.
SOMERVILLE, WILLIAM.....	Viola.
STAGER, MRS. E. J.....	Sauk Rapids.
STONE, I. N.....	Sioux City, Iowa.
STUBBS, NATHAN J.....	Long Lake.
TAYLOR, BARNETT.....	Forestville.
TERRY, ALFRED.....	Slayton.
UNDERWOOD, ANNA B.....	Lake City.
UNDERWOOD, J. M.....	Lake City.
WARD, C. W.....	Sumter.
WEBSTER, HIRAM.....	Lake City.
WEDGE, CLARENCE.....	Albert Lea.
WHITEHEAD, JOB	Pipestone.
WOODRUFF, PHILO.....	Faribault.
YOST, E. B.....	Minneapolis.

HONORARY MEMBERS FOR FIVE YEARS.

GEORGE J. KELLOGG, from 1882.....	Janesville, Wis.
G. P. PUTNAM, from 1882.....	Ash Ridge, Wis.
EDSON GAYLORD, from 1886.....	Nora Springs, Iowa.
J. E. CORLETT.....	Farmersburg, Iowa.
B. S. HOXIE.....	Evansville, Wis.
H. R. HUNTER.....	Sioux Falls, Dak.
C. H. BRETT.....	Henry, Dak.

HONORARY LIFE MEMBERS.

HON. MARSHALL P. WILDER (deceased)	Boston, Mass.
DR. JOHN P. WARDER (deceased)	North Bend, Ohio.
DR. P. A. JEWELL (deceased)	Lake City.
HON. L. B. HODGES (deceased)	St. Paul.
D. W. HUMPHREY (deceased)	Faribault.
HON. N. J. COLMAN	St. Louis, Mo.
GEORGE P. PEFFER	Pewaukee, Wis.
J. C. PLUMB	Milton, Wis.
J. M. SMITH	Green Bay, Wis.
E. WILCOX	La Crosse, Wis.
PROF. J. L. BUDD	Ames, Iowa.
CHARLES GIBB	Abbottsford, Quebec.
A. G. TUTTLE	Baraboo, Wis.
F. K. PHOENIX	Delavan, Wis.
J. W. MANNING	Boston, Mass.
MRS. J. W. MANNING	Boston, Mass.
MRS. WM. PAIST	Hersey.
CHARLES Y. LACY	Fort Benton, M. T.
COL. J. H. STEVENS	Minneapolis.
J. S. HARRIS	La Crescent.
R. J. MENDENHALL	Minneapolis.
TRUMAN M. SMITH	San Diego, Cal.
L. M. FORD	San Diego, Cal.
WYMAN ELLIOT	Minneapolis.
CHARLES HOAG	Minneapolis.
J. T. GRIMES	Minneapolis.
A. W. SIAS	Rochester.
PETER M. GIDEON	Excelsior.
MRS. WEALTHY GIDEON	Excelsior.
M. PEARCE	Minneapolis.
COL. D. A. ROBERTSON	St. Paul.
R. L. COTTERELL	Dover.
CHARLES LEUDLOFF	Carver.
OLIVER GIBBS, Jr.	Ramsey, Dak.
MRS. C. O. VAN CLEVE	Minneapolis.
MRS. JAMES BOWEN	Minneapolis.
MRS. IDA E. TILSON	West Salem, Wis.
MRS. H. B. SARGEANT	Lake City.
MISS SARAH MANNING	Lake City.

OFFICERS

OF THE

MINNESOTA STATE AGRICULTURAL SOCIETY

FOR THE YEAR 1887.

PRESIDENT.

WM. R. MERRIAM.....St. Paul.

VICE PRESIDENT.

IGNATIUS DONNELLY.....Hastings.

SECRETARY.

H. E. HOARD.....Hamline.

TREASURER.

F. J. WILCOX.....Northfield.

BOARD OF MANAGERS.

JAMES McHENCH.....Fairmont.

JOHN F. NORRISH.....Hastings

CLARK CHAMBERS.....Owatonna.

JOHN COOPER.....St. Cloud.

A. N. JOHNSONBenson.

L. H. PROSSER.....Wykoff.

The next annual fair will be held on the State Fair grounds between Minneapolis and St. Paul, Sept. 9 to 17, 1887. No effort will be spared to make it the best agricultural and horticultural exposition of the year.

Liberal premiums offered in every department. For further information address the secretary, as above.

CONSTITUTION

OF THE

MINNESOTA HORTICULTURAL SOCIETY.

ARTICLE I.

NAME.

This Society shall be known as the Minnesota State Horticultural Society.

ARTICLE II.

OBJECT OF THE SOCIETY.

The object of this Society shall be to improve the condition of pomology, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, trees, and other productions in horticulture as are adapted to the soil and climate of Minnesota.

ARTICLE III.

MEMBERSHIP.

Any person may become a member by paying to the secretary or treasurer an annual fee of one dollar, or a life member by the payment of ten dollars. Honorary members, for a time stated or for life, may be elected at any annual meeting by a two-thirds vote of the Society, and shall be entitled to all the rights and privileges of membership; provided, that honorary life members may pay a fee of ten dollars, in two equal annual payments of five dollars.

ARTICLE IV.

OFFICERS.

Its officers shall consist of a president and one vice president from each congressional district, a secretary, treasurer, and an executive committee of five, and a librarian.

ARTICLE V.

DUTIES OF PRESIDENT AND VICE PRESIDENTS.

The president shall preside at and conduct all meetings of the Society, and deliver an annual address, and in his absence the vice presidents, in their order, shall perform the same duties. They shall also have a general supervision of the horticultural interests in their respective districts, and make a written report to the Society at its annual winter meeting; in consideration of which the Society shall pay their traveling expenses to the same.

ARTICLE VI.

THE SECRETARY.

The secretary shall record all the doings of the Society, collate and prepare all communications, etc., for the public press, and pay over all moneys received from members or otherwise to the treasurer on his receipt; receive and answer all communications addressed to the secretary, establish and maintain correspondence with all local, county, district and state horticultural societies, and secure by exchange their transactions, as far as possible; to aid the president as an executive officer in the dispatch of business relating to the meetings of the Society, notices of horticultural and similar meetings of general interest, and report to the annual meeting of the Society an abstract of the matter that has come into his possession, which, with its approval, shall become part of its transactions of the current year.

ARTICLE VII.

THE TREASURER.

The treasurer shall collect and hold all funds of the Society, and pay out the same only on the order of the president, countersigned by the secretary. He shall make up a report of all

the receipts and disbursements of the Society, and present the same at the annual winter meeting, or at any other time when called upon to do so by the executive committee. He shall give bonds in such sum as the Society may direct, to be approved by the president and secretary, and the bond when so approved shall be filed with the state auditor.

ARTICLE VIII.

ELECTION OF OFFICERS.

The officers shall be elected separately and annually by ballot, and hold their office until their successors are elected.

ARTICLE IX.

MEETINGS OF THE SOCIETY.

The Society shall hold annual sessions on the third Tuesday of January, and other meetings at such time and place as the Society may direct.

ARTICLE X.

THE LIBRARIAN.

The librarian shall have charge of the library and report its condition at each annual meeting.

ARTICLE XI.

AMENDMENTS.

By-laws and alterations of the constitution, for the purpose of meeting the further wants of the Society, may be enacted by a vote of two-thirds of the members present at any regular annual meeting, and on one day's notice of the same being given.

BY-LAWS.

1. The president, at each annual meeting of the Society, shall appoint a general fruit committee, consisting of two members from each congressional district in the State, and it shall be the duty of each member to make a written report annually upon the fruit crop, and a limited list of fruits best adapted for general cultivation in their respective districts.
2. The president, secretary and treasurer shall be members *ex officio* of the executive committee, who shall have charge of all matters pertaining to the interests of the Society.
3. The executive committee may call a meeting of the Society at any time they may deem advisable, giving at least thirty days' notice through the public press.
4. The executive committee shall appoint a committee on seedlings, on nomenclature, on forestry, on fruit blossoms, on Russian apples, on gardening, on small fruits, and on floriculture.
5. The five members of the executive committee, not including the president, secretary or treasurer, shall be a committee on finance, and it shall be their duty to audit all bills before they shall be ordered paid by the president and secretary.
6. The executive committee shall see that a program is issued for each meeting of the Society, at least one month before the winter meeting and ten days before the summer meeting.
7. Every member shall be entitled to one copy of the transactions as often as published, on which postage shall be paid; but in the distribution of all other copies the party receiving the same shall pay the postage; where several copies are sent to auxiliary societies it shall be discretionary with the secretary to pay the freight.
8. *Quorum* — A quorum shall consist of nine members of the Society, or a majority of the executive committee.

MINNESOTA STATE HORTICULTURAL SOCIETY.

TRANSACTIONS 1886-7.

THE SUMMER MEETING, 1886.

[NOTE.—*This Society will not be held responsible for individual opinions which are found in this report.—Secretary.*]

The twentieth semi-annual summer meeting of the Minnesota State Horticultural Society, in accordance with the action taken by the Society at its annual session in January, was held at the state farm, near St. Anthony Park, Thursday, June 17, 1886.

Following is the announcement of the meeting, premium list and rules:

In accordance with previous arrangements by the Society, at its last annual session, the summer meeting will be held on the grounds of the state university farm, situated nearly midway between St. Paul and Minneapolis, one mile north of St. Anthony Park and near the state fair grounds.

An opportunity will thus be afforded members of the Society and others to visit the state farm and to carefully observe the practical methods there employed for the advancement of the science of horticulture, agriculture and experimental work being conducted there, under the management of Prof. E. D. Porter and the board of regents of the state university.

The location of the farm is convenient to both St. Paul and Minneapolis, trains leaving hourly from the Union depots of each city over the St. Paul, Minneapolis & Manitoba Railway.

Conveyances will be provided for the transportation of delegates and others to and from the station at St. Anthony Park, to the farm. Trains leave the depots of each city at 8:30 A. M. and hourly thereafter during the day.

It is to be hoped that there may be a full attendance of members, and all others interested in the advancement of the cause of horticulture, agriculture, and especially the experimental work being conducted at the state university farm. The ladies are cordially invited to be present and participate in the exercises of the day.

It is expected that exhibitors will be prompt and place all their exhibits on the tables by 10 o'clock A. M., so that the judges to be appointed can make their awards and report thereon by 12 o'clock.

While entries are being made and the judges are engaged in their duties, the visitors and members of the Society will be conducted over the farm, and an opportunity afforded them to examine the state buildings, and to visit the orchards, vineyard, gardens and other objects of interest about the premises. The location of the farm is a sightly one, affording a fine view of the surrounding country. The grounds and buildings are very pleasantly situated, and well adapted to the comfort and convenience of all who may see fit to attend the meeting.

After the awards of premiums have been made, the strawberries on exhibition will be appropriated for the purposes of the informal basket picnic, to be served at 1 o'clock. This will not be the least attractive feature on the program.

The meeting will be called to order by the president of the Society at 2 o'clock P. M.

A paper upon the subject of "Small Fruits for Market and Home Use," by J. S. Harris, of La Crescent, will then be read, to be followed by a short but sharp discussion.

Members in attendance at the meeting from a distance will be provided by the secretary, on application, with certificates which will enable them to return to their homes over the various lines of railway at one-fifth the regular rates, they having paid full fare coming to the meeting.

The annual report of the transactions of the Society for 1886 will not be ready for delivery till about July 1st.

S. D. HILLMAN, *Secretary*,
Minneapolis.

WYMAN ELLIOT, *President*,
Minneapolis.

PREMIUM LIST.

PROF. E. D. PORTER, Superintendent of Exhibits.

STRAWBERRIES.

1st Prem. 2d Prem.

Best general collection of not less than five named varieties, one pint each.....	\$5 00	\$3 00
Best four varieties, one quart each.....	3 00	2 00
Best Minnesota Seedling, not before exhibited.....	3 00	2 00
Best quart Wilson's Albany.....	2 00	1 00
Best quart Countess.....	2 00	1 00
Best quart Charles Downing.....	2 00	1 00
Best quart Crescent Seedling.....	2 00	1 00
Best quart James Vick.....	2 00	1 00
Best quart Manchester.....	2 00	1 00
Best quart Glendale.....	2 00	1 00
Best quart Prince of Berries.....	2 00	1 00
Best quart Sharpless.....	2 00	1 00
Best quart Windsor Chief..	2 00	1 00
Best quart Seth Boyden.....	2 00	1 00
Best quart Green Prolific.....	2 00	1 00
Best quart Capt. Jack.....	2 00	1 00
Best quart Col. Cheney.....	2 00	1 00
Best quart Daniel Boone.....	2 00	1 00
Best quart Kentucky Seedling.....	2 00	1 00
Best quart Old Ironclad.....	2 00	1 00
Best quart Cumberland Triumph.....	2 00	1 00
Best quart Minnetonka Chief.....	2 00	1 00
Largest fruit of any variety.....	2 00	1 00

The same premiums may be awarded upon other varieties of equal merit.

VEGETABLES.

Best collection, not less than six varieties grown by exhibitor.....	\$5 00	\$3 00
Best 3 bunches of asparagus.....	1 00	50
Best 6 beets.....	1 00	50
Best 6 carrots.....	1 00	50
Best 6 onions.....	1 00	50
Best 6 radishes.....	1 00	50
Best 6 turnips.....	1 00	50

Best 6 stalks pieplant.....	\$1 00	\$ 50
Best 6 heads lettuce.....	1 00	50
Best 3 heads of cabbage.....	1 00	50
Best 3 heads of cauliflower.....	1 00	50
Best $\frac{1}{2}$ peck green peas.....	1 00	50
Best $\frac{1}{2}$ peck of string beans.....	1 00	50
Best $\frac{1}{2}$ peck of new potatoes.....	1 00	50
Best 6 cucumbers.....	1 00	50
Best 6 summer squash.....	1 00	50

FLOWERS.

Best collection cut flowers.....	\$5 00	\$3 00
Best collection of roses.....	2 00	1 00
Best hand bouquet.	2 00	1 00
Best collection of pansies.....	2 00	1 00

RULES.

The awarding committee shall close their labor and report to the Society at 12 o'clock M. They shall have power to recommend special premiums for seedlings, and articles of merit, not provided for in the schedule of premiums. They shall not award premiums to contributions unworthy of exhibition, even if there is no competition.

Competition shall be open to all, but the annual membership fee of \$1 will be deducted from premiums awarded to persons who are not members of the Society.



PROCEEDINGS AT THE SUMMER MEETING.

THURSDAY, JUNE 17, 1886.

The purpose had in view in holding the summer meeting of the State Horticultural Society at the state farm was to afford the members of the Society, and others, an opportunity to observe the practical in horticulture, and to take some notes concerning the methods pursued in the various departments of agriculture, horticulture, floriculture, etc., conducted at the experimental farm of the Minnesota State Agricultural College.

The day was very pleasant, and everything conduced to an enjoyable occasion. There were nearly one hundred persons present at the meeting during the day, among the number several from a distance. The forenoon was devoted to making entries of articles for exhibition, and taking observations of the progress made in horticultural work, and experiments being conducted upon the farm, under the management of Prof. Porter. About sixty entries were made for premiums.

APPOINTMENT OF COMMITTEES.

President Elliot announced the following committees:

On Fruits—Ditus Day, Farmington; W. B. Quinn, Rose Town; John T. Blaisdell, Minneapolis.

On Vegetables—W. E. Brimhall, St. Paul; J. G. Bass, St. Paul; J. F. Gilmore, Richfield.

On Flowers—Mrs. W. G. Hendrickson, St. Paul; Mrs. Isabell L. Blaisdell, Minneapolis; Mrs. Lizzie S. Smith, St. Paul.

On Resolutions—H. H. Young, St. Paul; J. W. Boxell, St. Paul; F. G. Gould, Excelsior.

The total amount awarded in premiums was \$51.50. Following is the list:

AWARD OF PREMIUMS.

STRAWBERRIES.

Best four varieties, William Lyons, Minneapolis, first premium, \$3.

Largest fruit of any variety (Crescent), W. G. Hendrickson, St. Paul, first premium, \$2; Geo. S. Woolsey (Windsor Chief), Minneapolis, second, \$1.

Best Minnesota seedling not before exhibited, William Lyons, Minneapolis, first premium, \$3.

Wilson's Albany—W. H. Brimhall, St. Paul, first premium, \$2; W. E. Brimhall, St. Paul, second, \$1.

Countess—William Lyons, Minneapolis, first premium, \$2.

Crescent—W. G. Hendrickson, St. Paul, first premium, \$2; William Lyons, Minneapolis, second, \$1.

James Vick—William Lyons, Minneapolis, first premium, \$2.

Manchester—M. C. Bunnell, Newport, first premium, \$2; W. J. Hopkins, Bloomington, second, \$1.

Glendale—W. E. Brimhall, St. Paul, first premium, \$2; H. F. Busse, Minneapolis, second, \$1.

Windsor Chief—William Lyons, Minneapolis, first premium, \$2.

Captain Jack—Geo. S. Woolsey, Minneapolis, first premium, \$2.

Jersey Queen—H. F. Busse, Minneapolis, first premium, \$2.

RASPBERRIES.

Crimson Beauty—Truman M. Smith, St. Paul, first premium, \$2.

CURREANTS.

Fay's Prolific—J. F. Gilmore, Richfield, first premium, \$2; also second premium on Stewart's Seedling, \$1.

FLOWERS.

Collection Roses—Mrs. M. S. Gould, Excelsior, first premium, \$2.

Hand Bouquet—William Lyons, Minneapolis, first premium, \$2.

Collection of Pansies—Geo. S. Woolsey, Minneapolis, first premium, \$2; William Lyons, Minneapolis, second, \$1.

VEGETABLES.

Asparagus—J. T. Grimes, Minneapolis, first premium, \$1; William Mackintosh, Langdon, second, fifty cents.

Beets—Early Egyptian, A. Rowe, Minneapolis, first premium, \$1.

Carrots—Henderson, A. Rowe, Minneapolis, first premium, \$1.

Onions—Silverskin, J. S. Gray, Minneapolis, first premium, \$1.

Cabbage—A. Rowe, Minneapolis, first premium, \$1.

Cauliflower—A. Rowe, Minneapolis, first premium, \$1.

Green Peas—A. Rowe, Minneapolis, first premium, \$1.

Cucumbers—A. Rowe, Minneapolis, first premium, \$1.

The fruits on exhibition were appropriated for the purposes of the picnic, which was spread upon ample tables, arranged in a grove near the farm buildings. There was an abundance of provisions for all, including strawberries and cream.

The meeting was called to order about 2 o'clock, P. M., by President Elliot. After the reading of the list of awards made by the committees on premiums, the president announced the discussion of the subject "Small Fruits for Market and Home Use." The discussion was opened by the following paper:

SMALL FRUITS FOR MARKET AND HOME USE.

By J. S. Harris, La Crescent.

MR. PRESIDENT: If I am to open this discussion upon the subject of fruit for market and home use, I will say in the first place that I am one who has always firmly believed in having an abundance of fruit for home use; I also think we should have fruit to supply the market, enough to give away, fruit to send everywhere throughout the United States, and fruits to send to the foreign parts of the world. I have always said it would be done some time—which shows my "greenness," perhaps—but I have always said we could raise fruit in this country and we were bound to do it. I believe the necessities of mankind are such that they will have fruit. It was not designed that man

was to have fruit why was it that Mother Eve should be tempted by that probably beautifully colored sour "crab," give it to Adam and cause him to bring toil and sweat upon the race.

There are a great many in Minnesota who do not believe we can grow fruit, and there are those who have predicted that we never would be able to grow apples successfully. But there are some here who have seen Minnesota grown apples. Still, admitting that we have not made a perfect success in the growing of the larger fruits as yet, we are making some progress in that direction. And there are other fruits equally as important as articles of commerce, as essential to health and happiness as the larger fruit.

STRAWBERRIES.

Among small fruits the strawberry does, as it should, stand at the head of the list. It ought to be grown by all people who have the land, in quantities sufficient for home use. No fruit is so easily raised, or grows so universally in every part of the world as the strawberry. It is found in the snowy regions of the North, and the sunny plains of the South. It grows in the valley and upon the hilltop, the forest or the meadow, and it is a favorite with all races of men. In its season it is more eagerly sought for in the market, and more largely used by all classes but the farmer, than any other fruit, and farmers are every year taking more interest in them. On suitable soil and with the right management, strawberries are immensely productive. Four hundred bushels are reported to have been taken from an acre of ground in one season, and one hundred and fifty bushels ought to be only an average crop. They are fond of a moist rich loam, somewhat sandy, and thrive best in seasons of frequent showers, or where they have plenty of water.

They may be set in the spring or autumn, but ordinarily, in this State, the best success will attend setting in the spring. Before setting a strawberry bed, the ground should be plowed or dug deep and made mellow; and if not already rich enough to bring a good crop of garden vegetables, should have some fine compost worked in. I usually set them in rows three feet apart and about eighteen inches in the rows. Rows of beets or bunch beans may be grown between them the first season, but it is better to keep eighteen inches of the centre between the rows open to facilitate cultivating, and let the plants cover the balance of the ground. Market gardeners often set what they term double

rows, fifteen or eighteen inches apart each way, then leave a space three and one-half or four feet, and then set another double row, and so on until the plantation is finished, and allow the plants to fill the intermediate space and about one foot on each side. This allows much of the work to be done with a horse and cultivator. For setting, select nice thrifty plants of the previous year's growth, and never set plants that have borne fruit.

It pays well to pick off all the blossoms the first season and give the plant the entire strength and growth within itself. All weeds should be kept down and the young plants encouraged to their best. In the fall the spaces left vacant for cultivating should receive a dressing of manure, and the plants are best to be covered with leaves, clean straw from bottom of stack, bagasse from cane mill, or brush from the woods. The latter, where convenient, is the best protection of all. In the spring, after the ground is done freezing and the plants have started, remove the covering and go over the bed and destroy every weed and grass that has heretofore escaped notice; and it will pay to scatter over the bed a coating of fine manure, that of neat cattle being the best. Go over them frequently, to destroy all the weeds, but disturb the roots as little as possible until after the fruit is gathered.

After the fruit is gathered go through all the spaces that were left vacant, and with spade or fork dig them deeply, rake down level, putting them in fine condition for the runners to make new plants, and with a spade dig out the old plants of last year, leaving about two feet between what is left to facilitate passing through and cultivating. If the weeds are kept out and an occasional dressing of manure given, the bed will last about three years, when the whole bed should be plowed under, and a crop or two of something else should be taken off before the ground is again used for strawberries. Unless this course is pursued it will pay the farmer better to set a bed every spring in rows about two feet apart, keep them clean and let them run at will, and the next season after the crop is off, dig or plow them under. This method requires two plots, as it is too late to set plants after the picking season. The first crop is always the best, except with the Charles Downing, and old beds are usually very troublesome to keep free from weeds and more liable to be troubled with the "white grub." The hill system is not as safe in this State, and not as well adapted for farmers.

GROWING FOR MARKET.

Where strawberries are to be grown principally for market and on a large scale, I recommend planting in long rows three to four feet apart, according to varieties; plants one to one and a half feet in the row. Cultivate frequently to keep the weeds down and the surface of the soil mellow, using for the purpose a strong, sturdy horse and a level-headed driver, an adjustable wheel hoe; or a cultivator frame, filled pretty thickly with one-half inch steel drag teeth. After runners start, contract the width of the cultivated space until it does not exceed fifteen to eighteen inches, and all plants that appear in these spaces treat as weeds, the covering and mulching to be the same as for home use. In the spring remove the bulk of the covering from over the plants, and unless the soil is very rich, give a dressing of the manure and ashes mixture, but do not hoe or cultivate until after the crop is harvested. If weeds or grass appear, pull them out by hand.

I consider it most profitable for the market gardener to take but one crop of fruit from the bed, and as soon as the last picking is made, plow the vines under, which method necessitates making a new plantation each spring. The market grower should invariably every spring set a bed of each variety that he intends to grow, expressly for growing the plants for the next spring's planting and keep them from fruiting, but always correctly labeled to prevent mistakes; by this method stronger plants are secured and varieties are less liable to run out.

VARIETIES FOR HOME USE.

Downer's Prolific is one of the hardiest and longest enduring varieties. Charles Downing is a larger and better flavored variety, but not as productive. The Wilson, upon all rich, loamy soils, is a great favorite. The Kentucky, Glendale and James Vick are later varieties, and will prolong the season of fruit. The earliest of all is the old Ironclad; hardy and productive. All of the above produce perfect flowers. The Crescent seedling is a female, or imperfect flowering variety, but when properly fertilized is much more productive than any of the perfect flowering varieties. The plants are hardy and adapted to a great variety of soils.

FOR MARKET.

There is more money in the Crescent seedling than any other variety that has been thoroughly tested. Next to the Crescent, upon strong soils, stands the Wilson, then Downer's Prolific.

For a profitable plantation of Crescents, it is best to use two or more varieties for fertilizing, say the old Ironclad, Wilson, Captain Jack, James Vick, or Glendale.

In making the plantation, I usually set one row of perfect flowering, two to three of Crescents, one of perfect flowering, and so on until the bed is full. The experience of the present season has shown that some varieties resist drought better than others. Upon my place I find a new variety called the Hintgen Seedling to stand the best; James Vick, second; Crescent, third; Wilson, fourth.

HARVESTING AND MARKETING.

The strawberry harvest makes a busy time, and no other fruit so pushes the grower, or allows so little rest at night or day while they last. After the berries begin to ripen rapidly they should be picked every day, and care taken that no ripe fruit is left upon the vines to work into the next picking and mould or sour the package.

I have never found the common practice of having the berries picked for a rate per quart to prove entirely satisfactory. The expert picker will frequently make from two to three dollars per day in the busy season, and then quit work as the berries become thin. This tends to demoralize all of the pickers engaged, and not unfrequently causes a strike or the acceding to demands that are ruinous to the grower. The best plan, in my opinion, is to engage enough pickers some time before they are wanted, agreeing to pay a certain per cent of the price weekly, retaining a portion of the compensation to be forfeited by those who do not remain the season through. Another good method would be to pay a certain sum per hour or day of not exceeding eight hours. Whatever method of employing pickers is adopted, every grower should have a set of printed rules, of which each picker should be furnished a copy, and every picker violating the rules should be discharged at once and kept from the field.

Women make the best and quickest pickers, girls next, and boys next; old men the poorest of all. It is well to have a fore-

man to superintend the picking, following close behind and seeing that each one picks clean and fills the boxes properly. Boys and girls do not work well together. Old men are too slow to make wages.

Every picker should be provided with a picking rack holding from four to nine full quart boxes or baskets, and one box in each tray reserved for receiving the small and inferior berries. It pays well to assort the fruit, even if the poorest is thrown away. Then it is profitable to use only clean new boxes or baskets and attractive crates, and have the name of the grower stamped upon each box or crate. Two varieties should never be mixed together in the same box, and the grower's name should be a guarantee that the top berries are no better than they run through the box. There is no harm in placing the top berries so that the stems and hulls are concealed, provided they are no larger than they run through the box. The strawberry man should have the privilege that others enjoy of showing his goods to the best advantage.

Snide boxes are used by some growers. To do so ought to be a misdemeanor, and meet with prompt punishment. The law requires that berries be sold by dry measure. Every fourth or fifth quart is gained by selling in snide boxes, or by shoveling them into quart cups with a shingle.

RASPBERRIES.

The raspberry ranks in importance next to the strawberry. It delights in much the same soil and as it does very well in a partial shade, it may, where grown only for family use, be planted upon the north or east side of the garden fence. If the ground is naturally good when the planting is made, the fertility may be kept up with mulching and hop dressings. The rows should be set six or more feet apart, and the plants in the rows three to four. Where grown for commercial purposes it is economy to have long rows and use a horse in cultivating. Heavy mulching saves in expense of cultivating and tends to keep the soil moist and cool, which are favorable conditions for the raspberry. If when the canes reach the height of three and a half to four feet the top is pinched out it will make them grow more stocky and save the expense of tying up. For the convenience of keeping the fruiting canes upright and the fruit off the ground, a row of stakes may be set each side of the rows of plants, say 16 to

20 feet apart and a No. 8 wire stretched along say 2½ feet from the ground, with short wire across between each hill. The canes growing up between squares thus made obviates the necessity for tying.

All red varieties propagate by suckering from the roots and all surplus suckers must be kept down by treating them as weeds, or the plantation will soon become unfruitful.

BLACKCAPS.

There is more money in the Doolittle Improved, taken one year with another, than any other variety I have tested. The fruit of the Gregg is large and showy, but the plants are not hardy enough for this climate unless winter protection is given them. The Turner is the hardiest variety among the reds; the fruit is superior in flavor and appearance and a favorite in the market and at home, is also very early. The Philadelphia is more productive when given winter protection, but the fruit is not as salable. The Cuthbert is promising to take the lead as a late berry. The fruit is large and showy and ships very well, while the quality is second only to the Turner. I have not tested the newer varieties sufficiently to recommend them.

BLACKBERRIES.

The cultivation of the blackberry is beginning to assume an important place in the horticulture of Minnesota.

As I commenced the preparation of this paper last night, I did not have time to complete it, and I wish to say a few words further in regard to blackberries. Their culture is attracting the attention of farmers throughout the State, and is more particularly attracting the attention of market gardeners, who are finding it to be a fact that they can be grown as successfully here as in any other state. Like the raspberry, they should be put on rich soil. They should be pinched back when they are to the proper height. Keep them in hills, and do not allow them to spread over the ground, keeping all superfluous shoots trimmed out. The plants should be given protection by covering in the fall. A spadeful of earth may be removed on one side of the plant, bending the plants down till the top touches the ground, then fastening down with a little earth, and pass to the next hill. The canes may then be covered with earth, corn

fodder, brush, or anything most convenient. Where they are put down in this way, the blackberry has proved to be a successful crop to raise in Minnesota. I have never heard of a single failure. It is very prolific; its fruit comes at a time when our Southern friends are enjoying the luxury of peaches, and which, when they send up here, smell so strong of money that we can not afford to enjoy very many of them.

It is said that a crop of blackberries may be covered at a cost of from five to eight dollars per acre and that they can be grown about as cheaply as an acre of corn. The profit upon an acre of the fruit would be great, because the lowest prices we could expect to get would be, say, eight to ten cents a quart, and the profits should amount to from two to four hundred dollars per acre; therefore it must be a crop that will pay commercial gardeners to grow. It will pay them, at least until so many get to raising them as to bring down the price.

MARK YOUR BOXES.

An important matter in growing fruit is to mark your boxes, so that when a person gets a quart of your berries, he will want to buy of you again. One thing that has hurt the market gardeners and the fruit dealers is, that they have not stood up to law and reason. They allow a man to come into the market, whom you might call a "shark," or a "pirate" (that is a better name), who will take the berries that are shipped in from a distance and place them in boxes among the berries that you have brought in to sell, with your name on the boxes. The customer is thus imposed upon, and it hurts your reputation the whole season. There ought to be a pretty severe penalty attached for a man's using his neighbor's boxes without his consent.

Another thing is, a great many dealers purchase good, honest quarts in these boxes, and immediately dump the berries out and measure them in quart cups. Now, I will venture there isn't a legal quart cup in use in Minneapolis or St. Paul that will hold the quantity of berries contained in a legal strawberry box.

These are two things that should be changed: The taking of poor berries to market, and letting them be sold in honest men's boxes, and the shoveling them up with a shingle into quart cups; both tend to bring the price of strawberries down; that is to say, the retail dealer gets his berries a great deal cheaper, and the

consumer does not get the benefit. It is a fraud upon the grower and the consumer, and there ought to be a law to protect those two parties. The middleman will protect himself. Commission men usually sell to retail dealers, in the original packages, and are therefore not subject to this criticism.

DISCUSSION.

Mr. T. M. Smith. In protecting the blackberries and covering them for winter, wouldn't it be as well to use a fork as a spade?

Mr. Harris. I would just as soon use a fork; but I am supposed to be talking to farmers.

President Elliot. You haven't named the variety of blackberries that would succeed here.

Mr. Harris. There are but two varieties that I would recommend for this State; first, what is known as the Ancient Briton, and next the Snyder. The Ancient Briton will produce more berries, but the Snyder might stand when the Ancient Briton would kill down. And it is perhaps a week or ten days earlier than the Ancient Briton.

Mr. Jackson. I would like to inquire about a berry found in old pastures in Wisconsin known as the Dewberry. Is it hardy?

Mr. Harris. I have had no experience with it but know that it is being cultivated to some extent. The difficulty in the varieties found in this State is that they are not productive. In Virginia they have found two or three varieties that are immensely productive. The advantage in raising that berry would be that it is still earlier than the Snyder, the fruit is larger and I think it is better in flavor than any other species of the blackberry, and being of a trailing habit it is very easily protected in the winter, and in some seasons would perhaps need little or no protection. They grow them some in our locality and they do not winter-kill.

Mr. C. L. Smith. They are growing right here in the garden.

Mr. Jackson. One question in regard to raspberries. Is there any well-recognized variety of raspberries grown without prickles on the vines?

Mr. Harris. Davison's Thornless has few if any briars on the canes. It produces very well some years. But I do not think there is much difficulty in that regard with the thorny kinds where they are properly trained on wires; it makes very little

difference in picking. I did not go into a regular discussion of the manner of raising them in the paper. Of course you should remove the old canes; those are what hurts one's conscience. I have found that the Cuthbert wants winter protection. The Turner will endure the cold winters better than the Cuthbert.

Mr. T. M. Smith. I don't think you can raise the blackcaps without covering, but you may the reds. Davison's Thornless did well with me, but in three or four years it would kill out.

Mr. Harris. I think the Gregg is better but it is a tender variety. The Ohio is promising to be very good.

Mr. T. M. Smith. The Tyler is also a very good variety.

Mr. Harris. The Mammoth Cluster has not borne well with me.

Mr. C. L. Smith. The Mammoth Cluster bore better than any other variety I had. The berries are worth twenty cents a box for all I can get of them.

Mr. Jackson. I am glad that Mr. Harris has brought up this question of short measure in berries. I think it is one of the growing tendencies in both cities here; we have got to meet it and it ought in some way to be brought before the people. I am aware that I am being cheated when I buy my berries, but I hardly know how to help it. I find the berries will fall short every time where they pour them into one of their quart cups.

Mr. Harris. They put them in too loose.

Mr. Jackson. You are getting doubly cheated and it is worse now than it was last year. The boxes are smaller and the bottoms are nearer the tops.

Mr. Woolsey. I tried for four or five years to give a good dry-measure quart and they didn't like it. I found that people generally would pay more for the small boxes. They want to be cheated, and so now I want to cheat them. [Laughter.] Now I buy the smallest boxes there are in the market. I have found grocery men shaking berries from large boxes into smaller ones, and when I have asked what they were doing they have replied they were making more quarts, and since I have found out that the American people love to be swindled I love to swindle them.

Mr. Gray. I notice two places in the essay where Mr. Harris recommends, in putting on manure in growing strawberries, to put on unleached ashes. All through my life I have been connected with agriculture, and this is the first instance where I have heard a man recommend putting ashes and manure together, at any one time. I had supposed it had become a settled fact.

long since, that by putting unleached ashes wherever there was manure, it had the tendency to take from the manure the ammonia, so that the greater part of the manure is lost. I don't know why I have been misled all these years; if I have been, I am glad to learn something from Mr. Harris.

Mr. Harris. I would state that you are correct. I don't approve of it. I got up this paper in a hurry, and that got in unknown. [Laughter.]

Prof. Porter. In connection with that matter of using wood ashes and manure, I would say that there is no harm done where they are mixed together, if they are immediately put in the ground. Then there will be no loss, because the best absorbent is the soil itself. If it is to be allowed to stand for a week or two, you had better not mix them, as the wood ashes will at once liberate the ammonia.

Mr. Gray. You don't advocate its use for a top-dressing?

Prof. Porter. No, sir; unless mixed with earth or some other absorbent.

Mr. C. L. Smith. If it is mixed with dirt it makes a good top-dressing.

Mr. Harris. We often put hen manure with ashes to spread on the ground where it is to be plowed under immediately, and it is a good plan; but I don't believe in doing it where the mixture is left on the surface.

REMARKS BY PROF. PORTER.

Prof. Porter being called for came forward and said:

MR. PRESIDENT: You have called upon me to make a few remarks and in complying with your request I wish to say that I am very glad to see so many of the representatives and friends of the State Horticultural Society here to-day. It was of course an experiment to have a meeting of this kind at this place, and I think has proved to be a very successful one so far as numbers are concerned. And I am very glad that you are here at this time because you have an opportunity to see our experimental farm when it is in the initiative stage. As you see we are just commencing work here.

If you come out here annually, as I hope you will do at this season of the year, you will be able to observe whether we make any substantial progress or not in our work.

If you had come here three years ago you would have seen quite a different state of things. The underbrush was so dense that a blackbird could scarcely have gone through it; you would have found the farm grown up to weeds and grass, with hedge rows about four rods wide; not a panel of good fence on the place; not a farm building, except an old shanty; an old stable large enough for three horses and two cows. One hundred acres of this farm we have been in possession of but two years, although of the upper part, consisting of about one hundred and fifty acres, we have had possession of for three years. We commenced three years ago this spring.

We are now just commencing our real educational and experimental work. And perhaps it will be well enough for me to state what the object of this farm is. It is called the "Experimental Farm," and it is called the "University Farm;" and it is called the "State Farm." It is neither the one nor the other. It is really a practical school, a practical farm, a place to train and educate the young men that we expect to have in the department of agriculture, in the practical details of farm life. That is really the object of the farm. It is not a model farm. A model farm is one in which you never have any weeds, one where there are no bugs, where there is no very dry weather, no very cold weather, or anything else that is not just right, but where everything is "perfect" and where you get the very best results from the least expenditure of money. That is a model farm! I say this is not a model farm, for we have weeds and bugs, etc.

This is not an experimental farm. An experimental farm can not be run by common labor. It can not be run by the kind of labor that we get at twenty-five dollars a month. When you establish such an experimental farm as is desirable in all departments of grain, and stock and fruit and flower and vegetable, it will require for its superintendence, and management in all its details, men who will cost you perhaps \$3,000 a year. This will be necessary in order to have it of practical value and benefit. Thus far we have had no money for that work. Many of the leading states of the Union are pushing this experimental work, and I do not know of a state where anything is being done that does not receive less than \$5,000 for that work; the state of New York receiving \$15,000 to \$20,000. We have not reached that point yet.

It is true this line of work promises the best results to the farmers of this country at the present time. It is worth a good

deal more than the agricultural work, and worth a good deal more than model work; it is worth a good deal more than a practical school; the work of experimentation, the solution of a thousand and one problems that present themselves to the practical farmer, stockman and horticulturist, but that requires money, and we have not had the money as yet to appropriate to that purpose.

The time and the money that have been expended thus far have been employed in the purchase of this farm, the erection of our buildings; in its equipment so far as it has gone, and the money has come from the university, and has been secured through the manipulation of the old farm, which cost, as many of you perhaps do not know, about \$8,000. That \$8,000 has been converted into this splendid farm, worth to-day \$300,000, by careful manipulation, and not a dollar of money has come from the State of Minnesota.

And so you see this is not the state experimental farm; it is the state university farm; and we expect to make this the experimental station of the University of Minnesota, whenever the State makes an appropriation to carry on the work. At present our means are limited to what the university can spare.

At the present time we are endeavoring to make this a practical farm, an illustrative farm, and trying to do as much for the work of experimentation as our time and funds will permit. After we have it fully established we do propose to make it also a model farm.

I do not wish to occupy much of your time, but I would like to point out a few lines of work that we are now conducting, which you may notice as you pass over the grounds, that you may know what the lesson is to be this year. You may see some bare places here, and a mistake over there, where the boys didn't plant deep enough or too deep. What are the lessons? Next time they will be more careful. And remember that quite as much is to be learned from failure as from success. We want to know what to avoid, as well as what to imitate.

In that field of wheat we are experimenting with two varieties; there are three sets of experiments. We have laid off the ground into exact quarter-acre strips, in the first series, we are testing the merits of deep and shallow seeding in the first plat, putting the grain in to a depth of an inch and a half, the next is 2 inches, the next 2½, the next 3, the next 3½, and the next 4 inches. You can see the result to some extent now; and at har-

vest time it will be harvested and threshed, the grain carefully weighed and measured and the results reported. Then we tried the experiment of thin and thick sowing. We have strips sown with a bushel, a bushel and a peck, a bushel and a half, a bushel and three pecks, and two bushels to the acre. Then we have another set, illustrating the effect of medium, early and late seeding. One set, I think, only seeded about ten days ago. Then, in this strip up here, you will find two or three rows containing samples of the leading varieties of spring wheat. Among them are twelve hybrids obtained from Prof. Blount, of Colorado. You know his wheat took the gold medal at New Orleans.

Now, to show the effect of thin seeding; as you pass over the ground you will see that it is in some places completely covered, while in others it is almost bare. One can see at a glance the practical results.

You pass over here in this corner and you find three hundred and sixty varieties of potatoes; you will find plenty of potato bugs, also.

In the other corner of the field you will find an orchard of Russian apples. We planted these trees a year ago, from a supply of such Russian varieties as were found by Prof. Budd and Mr. Gibb. We have duplicates of these growing from root grafts, in the nursery. The idea is that if there is found to be anything of value when they come into fruiting, we can duplicate them, by the hundreds, in the nursery. These varieties of apples will be grown for distribution among the farmers and horticulturists of the State. We have attempted, also, to grow the different kinds of strawberries, etc., with what success you must judge after a visit to the grounds.

We propose to grow small quantities of everything in the shape of fruit, flower and vegetable, of grain and grass, and of stock, that can be successfully grown in the State of Minnesota. We will do this, in order that our students may know the difference between a cabbage and a turnip, a beet and a parsnip, by actual contact with them.

Prof. Porter here referred, at length, to the experiments being conducted in the line of feeding stock, etc. Continuing, he said:

In stock we expect to have on the place illustrations of all the leading breeds of animals; as yet we have only two breeds of cattle, the Holstein and the Shorthorns. And if any of you will remain here until between four and five o'clock you will have an opportunity of seeing them brought up. We have about sixty

head of horned stock on the place and about two hundred sheep. A part of our sheep you will find in that field are thoroughbred Shropshires; they were imported. The others are common scrubs that we picked up anywhere we could last winter to eat up the feed and to get grade lambs from. Those will all be turned off to the butcher by the first of September. We will keep a few of the leading breeds for illustration. We shall do this so that the young men who come here can distinguish the difference between the different breeds of sheep as well as between an Ayreshire, a Jersey, and a Shorthorn. We want them not only to look in a book to learn what a cow is, but to sit down and milk her, feed and take care of her. That is the way to make practical farmers.

Not to detain you too long, I wish to say that we have just made a commencement; we have a vast amount to do. There are buildings to be erected and fences to be built, and fields to be cleaned, and we don't want to do it all at once. If we do it all to-day there will be nothing to show these boys next year. But when you come out here next year we want to show you some improvement. We want to have you come and will be glad to see you at any time, except on Sundays, when our gates are not open. Thanking you for your attendance, we hope to see you again another year.

I would be very thankful to the representatives of the horticulturists and farmers of Minnesota for suggestions, assistance and advice. This farm is established in your interest. If you have new plans, new ideas and new stock, I shall be very glad to have you indicate your views in order that we may put your suggestions into the line of experimentation and report upon the same. We expect after a little to issue a quarterly bulletin that will give the results of experiments on the farm. These will be scattered broadcast, and sent out to the newspapers of the State. We invite suggestions and honest, legitimate criticism. But we don't want anybody to say, "Why don't you do this, and why don't you do so and so?" unless you can show us a better way.

Mr. Jackson. Mr. Chairman, I have been deeply interested in the remarks of Prof. Porter. I want to say that you are doing a work in this State Horticultural Society that is wider than the State of Minnesota. I was at Bismarck a few days since and I found people there who were anxious to know what you are doing down here in the way of raising fruit. There was with our

party a gentleman by the name of Marshall, from Alleghany City, who had been traveling considerable and had resided in Asia for five years, who stated that he found the climate and the soil here to be very similar to the country visited by him in Northern Asia, where, he said, they were able to grow all kinds of fruit, such as apples, plums, and cherries, and even figs. Of course it is hardly necessary to allude to this among the older members of this Society who have its reports, but it may serve as encouragement to younger members to know that it is possible to raise apples, and all of these tender fruits that are so much to be desired, in these prairie countries. I think I voice the thoughts of those present, when I say we are doubly thankful for the privilege of meeting here, and I think it will be a silent educator for us to hold our summer meetings here; it seems to me a happy thought. Here we have an opportunity to learn from observation, which is the best way to learn. We are doing work for the benefit of a vast empire; for there is a vast territory to the west and tributary to these two cities, and I trust what is brought out here will prove of advantage and profit to many.

Mr. Harris. Mr. President, I see with us to-day Col. D. A. Robertson, of St. Paul, who had something to do in setting the ball in motion in establishing the Minnesota State Horticultural Society. Since he last met with us he has traveled some in Europe, and I believe we would all be interested in hearing a few remarks from him.

President Elliot. It gives me great pleasure to have Col. Robertson spoken of, and I hope he will favor us with some remarks.

Col. Robertson. Mr. President, I came here because I desired to come; am glad to see the old faces again and to see the work that is going on, and to hear about what I will call the experiment farm, what they would call in Europe a botanical garden. I have been very much gratified with your remarks, professor, and I agree with you perfectly as to what should be considered the paramount purpose of investments in such an undertaking as you have commenced here. You embrace many departments of work, but what I regard as of the greatest importance of all, is to have everything begun here that could be of use to the people, to be introduced for experiment, for demonstration, and for the instruction of the people of the State. Here are men whom I see around me who have devoted much attention to horticulture; here are those whom I have known for many years. These men can not afford to establish botanical gardens; experi-

mental establishments to discover what can be grown in Minnesota; and I think you will all agree with me in this statement, that there is only one truly successful way under heaven to acclimatize a plant to any country, and get the best result from that species, and that is from the seedling. I have found in my studies, both at home and abroad, that it is a universal fact without exception. Further than that, I have found, as a result of much study, travel and reflection, that the only possible chance for improvement in plant growth, for proper adaptation of growth, for the promotion of longevity of plant growth, is by going back to the seed.

The most valuable product of France is the vine; not for the table alone, not for dessert, but for life-saving, wine; pure wine, sir. We have very little pure wine in this country. But pure, unalcoholized wine, such as was made in the time of the old Hebrews, pure wine, containing nothing but the juice of the grape. That is one item; then again, here is a fact that our people have to learn: We see that the value of species will wear out, and you must commence anew. Where are our old varieties of oats? Where are our peachblow potatoes, or all those other fine varieties of the potato that we used to have? All gone; and how? By fungous growth; from what they call "blight" or "dry rot" and all sorts of names; and so we must prepare to introduce new varieties all the time, and at the same time study to have climatic adaptation.

In fruits we will have to go back to Asia Minor, which has been spoken of, where they have every variety of climate. We will have to go back there, as the Greeks and Romans did, to get the wild plants and to commence anew. That is what we have got to do here; and so with regard to wheat and every other kind of crop; for improvement, that is the only thing we have to do; we must get the plants that can be grown with perfection here, the best kind for the climate, and then make this climate the best we can make it.

Do you believe it is possible to improve this climate?

Mr. Harris. I do.

Col. Robertson. I am sure it can be done. Before I started for home I saw a method tried in France for the protection of plants by means of a fence some six feet high. There, although the climate is almost semi-tropical, is a cold wind that comes down from the Alps, along the Mediterranean, the fence will protect the gardens situated a hundred miles to the north

of Marseilles. The same plants are destroyed every season without such protection. It is not the cold of winter but it is in the spring the harm is done. I mention that fact to show what may be done by very slight protection. Again, we find that heavy storms may be prevented, or the destruction arrested they may be stopped in their progress,

Last season while I was in Switzerland, at a time when the crops were in fine condition there came these storms; all along the different valleys, from south to north, in every direction; about Lucern, and to the north of us that great grape region, where the destruction amounted to millions of francs for that season, and I suppose to two or three millions of dollars in fact. It is proven by the fact now demonstrated that wherever vineyards were protected by trees of any extent, the storm took the same direction as it did here, northeast, or easterly, and the vineyards escaped; where not so protected the vineyards were destroyed, or the crop for the season.

There has been great alarm in the vicinity of St. Paul about cyclones, as they are called; tornadoes, if you please; great alarm. People around here and in other localities in Minnesota, rushing into their cellars. Have you never heard of that before?

Prof. Porter. Yes, sir; every time a cloud comes up.

Col. Robertson. Every time. Now, as I was about to remark, this is what I am interested in. I have investigated the subject as far as possible for the last quarter of a century to ascertain if ever a cyclone or tornado ever got over our big woods; that's the point!

Mr. T. M. Smith. We have had them at St. Paul.

Col. Robertson. No, sir; never one!

Mr. Smith. I saw the time when the storm took down a hotel.

Col. Robertson. I saw that. But you don't know my nomenclature, but I remember the storm very well which was so severe in Kittson's addition to St. Paul; I was here at the time in 1853. It was a building yet unfinished on the "balloon" style; but it was no tornado, or cyclone. You mean one of those funnel-shaped things that comes down with a spout to the ground. I mean to maintain, sir, that you are entirely mistaken, that there was no such storm as that. The name cyclone we borrow from the Indian Ocean; the hurricane from the West India Islands. And when they reach here the spout is lost, as it must be in the big woods to get here. We have never seen a tornado this side of them; they never get this side; I have the record of

them from the different accounts. That storm referred to was not a tornado, but a "tempest." [Laughter.] It was no tornado or cyclone, and there is the distinction.

Mr. T. M. Smith. How about Sauk Rapids?

Col. Robertson. There it was a tornado, but it was not a cyclone according to the correct definition. I did not intend to go on at this length, but I want to say that there is little danger of the tornado in this locality. I believe that forestry is the most important object we can pursue here now in the State of Minnesota to ameliorate our climate. If the big woods were to be destroyed you would have a wondrous change in the climate of this State. I thank you for your attention, although I did not expect to speak at all.

Mr. Young, from the committee on resolutions, presented the following, which, on motion, were adopted by a rising vote:

THE RESOLUTIONS.

Resolved, That the members of the Minnesota State Horticultural Society take this occasion to express their gratification with what has been done and is being done at the experimental farm of the State Agricultural College, and their conviction that the results attained here, from this time forth, will be of the greatest advantage to the farmers of the State generally, in that it will give them the full benefit of costly experience, without subjecting them to the expense and labor of individual experiments.

Resolved, That the present condition of the farm, as compared with what it was three years ago, when the work was started, shows a praiseworthy degree of energy on the part of the management, and the display of a high order of practical ability in planning and developing the work; and that we find everything in the different branches of farm industry in as forward condition as seems possible for them to have been brought in the time and with the means the manager has had command of.

Resolved, That the farmers and citizens generally of the State owe to the superintendent of the farm, who is understood to have planned and executed this work, their sincere and hearty support and encouragement, and we hope that he will be unanimously sustained by them in carrying it to completion.

Resolved, That in our opinion, a monthly or quarterly bulletin, reporting progress in the development of the farm and the results of experiments completed, ought to be published by the management and circulated throughout the State for general information.

¶ *Resolved*, That the thanks of this Society are due, and are hereby tendered, to Prof. E. D. Porter and family for the cordial reception and kind entertainment extended to us; and also to the railroad companies of the State for their liberal reduction of fares made to members attending the meeting.

H. H. YOUNG,
J. W. BOXELL,
F. G. GOULD.

Mr. C. L. Smith stated that he had just returned from a trip to the Red River Valley, in Dakota, and found the people eager to learn how to grow strawberries. He asked for fifty copies of the last report of the Society for 1886, for distribution throughout the valley.

On motion, the request was granted. The editor of the *Farm, Stock and Home*, who was present, volunteered to distribute the books free of expense to the Society.

President Elliot. Friends, this is our first visit here to the State University Farm, as a society, and I hope and trust it will not be the last. I trust that another year we shall come with our wives, our daughters, and our friends, and make a still larger circle, and see if we can not encourage our friend, Prof. Porter, in the good work which has been begun.

The meeting then adjourned.



MINNESOTA STATE HORTICULTURAL SOCIETY.

TWENTIETH ANNUAL MEETING

AT THE STATE CAPITOL, ST. PAUL, TUESDAY, WEDNESDAY,
THURSDAY AND FRIDAY, JANUARY 18, 19, 20, AND 21, 1887,
IN JOINT SESSION WITH STATE AMBER CANE
ASSOCIATION.

Following is the circular sent out announcing the annual meeting of the Society :

The twentieth annual winter meeting of the State Horticultural Society, will be held at the capitol, St. Paul, on Jan. 18 to 21 inclusive, 1887, the State Amber Cane Association occupying the time for its tenth annual session, on the afternoon of Wednesday, January 19th.

The public are earnestly invited to attend the meetings, which are *free to all*. Ladies are very cordially invited.

Members are specially urged to be present, and all others interested in the objects of the meeting. Local societies are requested to send delegates and participate in the proceedings. It is desired that this may be one of the most interesting and profitable sessions yet held in the history of either association.

Reports from individual members of committees are expected in person, or by manuscript. Let none be negligent in this respect, to the end that we may know whether fruit culture is making that progress it should throughout the State. Give concise reports of varieties cultivated in your immediate neighborhood, with names of persons having the greatest success with fruits, flowers or vegetables, and the names, as far as possible, of varieties under cultivation succeeding best; especially of hardy, new varieties, or seedlings that may be more fruitful or better adapted to your location than old and tried varieties; stating character of soil, exposure and protection, if any.

Members of committees and others are requested to send or bring sample products of fruits, flowers and vegetables, in order to make an attractive and

instructive exhibit. Liberal premiums will be given, but not on inferior or unworthy articles, even if there be no competition.

* The following lines of railway will return delegates at one-third fare on the certificate of the secretary, to-wit: Chicago, Milwaukee & St. Paul Railway, Chicago, St. Paul, Minneapolis & Omaha Railway, Minneapolis & St. Louis Railway, St. Paul & Duluth Railroad and Minnesota & Northwestern Railroad. The Minneapolis & Pacific Railway, St. Paul, Minneapolis & Manitoba Railway and the Northern Pacific Railroad return delegates at one-fifth fare. Those coming over the last two lines mentioned, on purchasing tickets, must also procure receipts, showing they have paid full fare one way.

Members in attendance from a distance will be provided with entertainment by the local committee on arrangements.

For further particulars, address

S. D. HILLMAN, *Secretary*,

MINNEAPOLIS.

WYMAN ELLIOT, *President*,

MINNEAPOLIS.

State Horticultural Society.

EDWARD D. PORTER, *Secretary*,

RUSSELL BLAKELEY, *President*,

ST. ANTHONY PARK.

ST. PAUL.

State Amber Cane Association.

PROGRAM.

The following order will be adhered to as near as circumstances will permit, but may be varied from time to time as the Society may deem best:

FIRST DAY—TUESDAY, JANUARY 18TH, AT 10 A. M.

Opening Exercises. Arrangement of Exhibits and Reception of Members.

Appointment of Committees. Committees on Revision of Fruit List; on Award of Premiums; on Publication; on Final Resolutions; on Obituary.

Question Box.

AFTERNOON SESSION—AT 2 P. M.

Address of Welcome. Prof. D. R. Maginnis, of *Farmer*, St. Paul.

Response to Address of Welcome. S. M. Owen, of *Farm, Stock and Home*, Minneapolis.

Reports from Local Societies. Hennepin County Horticultural Society, J. E. Northrup, secretary, Minneapolis; Olmsted County Horticultural Society, M. J. Hoag, Rochester; Minnesota Valley Horticultural Society, A. B. Regester, Granite Falls; Lakeside Horticultural Society, A. S. Crossfield, Browns Valley; McLeod County Horticultural Society, H. I. Corson, Glencoe; and others.

Correspondence, etc.

Cold is King; How Modified in the Cold Northwest. E. H. S. Dartt, Owatonna.

Reports of Assistant Superintendents at State Fair. On Fruits, F. G. Gould; Vegetables, J. T. Grimes; Bread, Pickles and Preserves, Ditus Day.

Russian Apples at State Fair. Chas. A. Keffer. Experimental Farm.

EVENING SESSION — AT 7 P. M.

President's Annual Address. Wyman Elliot, Minneapolis.

Grape Growing for Farmers. J. B. Rogers, Milburn, N. J.

Pruning and Training of the Grape. With Illustrations. M. Pearce, Minneapolis.

Discussion on same.

SECOND DAY — WEDNESDAY, JANUARY 19TH, AT 9 A. M.

Report of Seedling Commission. John S. Harris, La Crescent; G. W. Fuller, Litchfield; A. W. Sias, Rochester.

Our New Seedlings. Peter M. Gideon, Excelsior.

Report of Committee on Russian Apples.

Discussion on same.

Report of Committee on Vegetables.

AFTERNOON SESSION — AT 2 P. M.

Tenth annual meeting of the State Amber Cane Association.

PROGRAM.

Minutes of the Last Meeting Read.

Reception of Members.

Report of Secretary and Treasurer.

Election of Officers.

Appointment of Committees.

President's Address.

Paper. By Hon. Seth H. Kenney, Morristown, Minn.

Reports from Growers and Manufacturing of Amber Cane.

EVENING SESSION — AT 7 P. M.

Hon. N. J. Colman, United States Commissioner of Agriculture, Washington, D. C., or one of his assistants, is expected to be present and address the convention Wednesday evening.

Recollections of Fifty Years with Small Fruits. J. M. Smith, President Wisconsin State Horticultural Society, Green Bay, Wis.

Volunteer Reminiscences of Pioneer Horticulturists.

THIRD DAY — THURSDAY, JANUARY 20TH, AT 9 A. M.

Annual Report of Secretary.

Annual Report of Treasurer.

The New Strawberry. G. J. Kellogg, Janesville, Wis.

Report of Finance Committee.

Birds in Horticulture. Eugene E. Harris, La Crescent.

Discussion on same.

Notes by the Wayside. C. L. Smith, Minneapolis.

AFTERNOON SESSION — AT 2 P. M.

Ad Interim or District Reports, by Vice Presidents of the Society. A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; M. Cutler, Sumter; F. G. Gould, Excelsior; G. W. Fuller, Litchfield.

Discussion on same.

Annual Election of Officers, by ballot.

Propagating and Perpetuating Species by Grafting, Budding and Layering.
J. S. Harris, La Crescent.

Entomologist's Report. Prof. O. W. Oestlund, Minneapolis.

Amateur Flower Garden. Frank H. Carleton, Minneapolis.

Rose Culture. F. G. Gould, Excelsior.

A Pretty but Inexpensive Flower Garden. C. L. Smith, Minneapolis.

EVENING SESSION — AT 7 P. M.

Report of Committee on Floriculture. Mrs. C. O. Van Cleve, Minneapolis;
Mrs. Anna B. Underwood, Lake City; Mrs. M. S. Gould, Excelsior.

County Fairs. O. C. Gregg, Minneapolis.

Relation of Education to Agriculture. Lecture by Cyrus Northrup, L. L. D.,
President State University, Minneapolis.

FOURTH DAY — FRIDAY, JANUARY 21ST, AT 9 A. M.

Reports from Experimental Stations:

PROF. E. D. PORTER, St. Anth'y P'k.	CHARLES LUEDLOFF, Carver.
PETER M. GIDEON, Excelsior.	UNDERWOOD & EMERY, Lake City.
M. PEARCE, Minneapolis.	B. TAYLOR, Forestville.
G. W. FULLER, Litchfield.	FRED VON BAUMBACH, Alexandria.
A. W. SIAS, Rochester.	E. H. S. Dartt, Owatonna.
R. M. PROBSTFIELD, Moorhead.	L. E. DAY, Farmington.
F. J. SCHREIBER, Moorhead.	J. S. HARRIS, La Crescent.
ANDREW PETERSON, Waconia.	O. M. LORD, Minnesota City.

Report of General Fruit Committee:

SIDNEY CORP, Hammond.	CLARENCE WEDGE, Albert Lea.
D. K. MICHENOE, Etna.	GEORGE E. CASE, St. Peter.
J. C. KRAMER, La Crescent.	M. CUTLER, Sumter.
O. E. SAUNDERS, Granite Falls.	G. W. FULLER, Litchfield.
O. F. NORWOOD, Balaton.	L. E. DAY, Farmington.
M. C. BUNNELL, Newport.	CHARLES LUEDLOFF, Carver.
N. J. STUBBS, Long Lake.	W. E. BRIMHALL, St. Paul.
WILLIAM MCHENRY, St. Charles.	WM. CANNON, Fort Lincoln, Dak.
O. M. LORD, Minnesota City.	

Discussion on same.

Native Plums. O. M. Lord, Minnesota City.

Reports of Special Fruit Committees.

Report of Committee on Award of Premiums.

Report of Committee on Nomenclature.

AFTERNOON SESSION — AT 2 P. M.

Laws Governing Hardiness of Plants. J. O. Barrett, Browns Valley.

Report of Committee on Forestry. J. T. Grimes, Minneapolis.

Discussion on same.

The Grasses. E. D. Jackson, Minneapolis.

Reports of Special Committees.

Report of Committee on Final Resolutions.

Place of Next Meeting.

Miscellaneous Business.

Final Adjournment.

PREMIUM LIST.

WM. E. BRIMHALL, ST. PAUL, SUPERINTENDENT OF EXHIBITS.

APPLES.

(All Plates to consist of five specimens).

Best collection of Minnesota apples, including hybrids, first premium, \$5; second, \$3; third, \$2.

Best display of Wealthy, first premium, \$3; second, \$2; third, \$1.

Best plate of winter apples, any variety, first premium, \$2; second, \$1.

Best plate of winter varieties, Russian apples, first premium, \$2; second, \$1.

Best plate of hybrids, first premium, \$2; second, \$1.

GRAPES.

Best display of grapes, in good condition, first premium, \$5; second, \$3; third, \$2.

Best plate, any variety, first, \$3; second, \$2.

Best display of fruit in glass jars, first premium, \$5, second, \$3.

PLANTS AND FLOWERS.

	1st Prem.	2d Prem.
Best display ornamental and flowering plants.....	\$5 00	\$3 00
Best display of roses in pots.....	2 00	1 00
Best display geraniums.....	2 00	1 00
Best single plant in bloom.....	2 00	1 00
Best display begonias.....	2 00	1 00
Best display carnations.....	2 00	1 00

CUT FLOWERS.

Best and most artistically arranged design, first premium, \$5; second, \$3.

Best collection roses, first premium, \$3; second, \$2.

Best hand bouquet, first premium, \$3; second, \$2.

Best cultivated cranberries, provided a history of their cultivation be furnished, first premium, \$5; second, \$3; third, \$2.

VEGETABLES.

	1st Prem.	2d Prem.
Best display.....	\$5 00	\$3 00
Best half peck early potatoes.....	2 00	1 00
Best half peck potatoes for winter and spring.....	2 00	1 00
Best half peck onions.....	2 00	1 00
Best half peck turnips.....	2 00	1 00
Best half peck beets.....	1 00	50
Best half peck parsnips.....	1 00	50
Best half peck carrots.....	1 00	50
Best Hubbard squash.....	1 00	50
Best bunch celery.....	1 00	50
Best winter cabbage.....	1 00	50

SEEDS.

Best display of Minnesota garden seeds, first premium, \$5; second, \$3.

PANTRY STORES.

Best display canned fruits, \$3; second best, \$2.

Best display jellies, \$2; second best, \$1.

Best jar mixed pickles, \$1; second best, 50 cents.

Best sample home-made vinegar, \$1; second best, 50 cents.

Best sample comb honey, \$1; second best, 50 cents.

Best sample strained honey, \$1; second best, 50 cents.

WORKS OF ART.

Collection of paintings, fruits and flowers, first premium, \$5; second, \$3.

Best single fruit painting, \$3; second best, \$2.

Display garden tools and horticultural implements, certificate of honorable mention.

Exhibitors are expected to make their entries the first day. All exhibits must be in place by 10 o'clock A. M., the second day.

Competition shall be open to all, but it is expected that the annual membership fee will be contributed unless exhibitors are members of the Society.

MINNESOTA STATE HORTICULTURAL SOCIETY.

ANNUAL WINTER MEETING

AT THE STATE CAPITOL, ST. PAUL, TUESDAY, WEDNESDAY,
THURSDAY AND FRIDAY, JANUARY 18, 19, 20, AND 21, 1887,
IN JOINT SESSION WITH STATE AMBER CANE
ASSOCIATION.

The twentieth annual winter meeting of the State Horticultural Society, held at room No. 16, state capitol, St. Paul, convened on Tuesday morning, Jan. 18, 1887. The meeting was called to order at 11 o'clock, by the president, Wyman Elliot, of Minneapolis.

Prayer was offered by J. S. Harris, of La Crescent.

President Elliot announced the following committees:

Committee on Award of Premiums: Prof. D. R. Maginnis, St. Paul; C. L. Smith, Minneapolis; J. S. Harris, La Crescent.

Committee on Final Resolutions: A. W. Latham, Excelsior; J. T. Grimes, Minneapolis; E. H. S. Dartt, Owatonna.

Committee on Obituary: J. S. Harris, La Crescent; Peter M. Gideon, Excelsior; W. H. Brimhall, St. Paul.

Committee on Hall: Prof. D. R. Maginnis and Capt. R. Blakeley, St. Paul; C. L. Smith, Minneapolis.

President Elliot stated that it was thought desirable to make a change in the program, to have the lecture of President Northrup delivered on Wednesday instead of Thursday evening, and the committee on hall were requested to ascertain if the hall of the House of Representatives could be secured, and to

invite the members of the legislature to be present on that occasion.

The balance of the forenoon was devoted to the arrangement of exhibits.

On motion, the meeting adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

TUESDAY, JAN. 18, 1887.

The meeting was called to order by President Elliot at 2 o'clock P. M.

ADDRESS OF WELCOME.

Prof. D. R. Maginnis, of the St. Paul *Farmer*, was introduced and delivered the following address of welcome:

Gentlemen of the State Horticultural and Amber Cane Associations of Minnesota:

Through the courtesy of your committee I am here to-day to welcome you to the capital city of Minnesota; a city in whose greatness and substantial prosperity, as with its younger but equally vigorous sister, Minneapolis, we all take a just pride; if only because they are a reflex of the causes which make them; for the nature of the country to which cities are tributary determines their growth as inflexibly as the forces which limit our existence. By a skilful adaptation of means to the end success has often crowned the efforts where conditions are not in the highest degree propitious, and difficulties seemed insurmountable. The very features of our climate, which fit it in such an eminent degree for the growth of the cereals and for the physical well being of our kind, do not offer the most favorable conditions for certain of our larger fruits, but who shall say that Minnesota will not yet send coals to Newcastle by exporting apples to Michigan and pears to the Golden State. I see before me the faces of men who have devoted years of painstaking observation and patient experiments to the origination of new and acclimatization of known varieties of fruits, and your work has surely not been in vain, for although the unprecedented cold of the last three winters has blasted many a promising orchard,

and with it the hopes of the owner, still the few varieties of trees which have passed through the frigid ordeal unscathed clearly demonstrate the fact that apples can be grown in Minnesota. Surely the people of the State owe a liberal meed of gratitude to your society and to its individual members who, ignoring money considerations, have given time and energies to a work often full of discouragements and disappointments, and every success of which is general benefit to the whole people.

Gentlemen of the Amber Cane Association: Untimely frosts have occasionally nipped your crops of cane but not your enthusiasm for your work. Your mission is to fix the carbon furnished by the sun, through the stalk of cane and transmute it successfully into the sugar and syrup of commerce. Recent experiments in the new diffusion process at Fort Scott, Kan., with which you are no doubt familiar, make it probable that this country may yet produce the bulk of the sugar which it consumes, and the syrup made from the amber cane already has an enviable reputation in the market. Our warm summers and rich soils offer more favorable conditions of growth than the sugar districts of Europe and resolve the question into one of the proper plant and right kind of appliances to effect the desired result.

Gentlemen, we welcome you to St. Paul, and trust that your deliberations may be appreciated by the public in the manner which their importance demands.

RESPONSE TO THE ADDRESS OF WELCOME.

S. M. Owen, of the *Farm, Stock and Home*, Minneapolis, responded on behalf of the Society. He said:

Mr. President, Ladies and Gentlemen:

The formal acknowledgment, in mere words, of so hearty a welcome as the one just given us, would seem to be a work of supererogation. The proper place for the true response to such cordiality should be in the heart, and not upon the tongue. There may seem to be an incongruity of flowers, fruits and sweets in a realm of winter carnival. It may, however, be appropriate for me, as the present mouthpiece of this Society, to briefly refer to some of its characteristics and labors, which inspired the pleasant words just said of it.

Horticulture, the best, the finest, the most intelligent cul-

ture—the belles lettres of agriculture, is something vastly different in a region of antipodal extremes—in a region where tropical heat is displaced by polar cold from what it is in more congenial climes. This Society came into existence at a time when the belief was almost universal that fruit growing was one of the impossibilities of this region. It was said that nothing of the fruit kind would grow here, save insignificant berries, which could mature under sun-protecting leaves and grasses; and crab apples and plums sufficiently bitter and sour to excite the contempt and disgust of Jack Frost. This verdict of man seemed to be warranted by the evidences of nature, so that it may well be said, the obstacles which confronted the infancy of the Society were really appalling.

It shall be no part of my mission to tell in detail what the Society has accomplished during the last quarter of a century. The story of its successes is more eloquently told in the luscious fruit, fragrant flower, thrifty orchard and succulent vegetable than any mortal tongue can tell it. In a region where the heat of summer is always as great an obstacle as the cold of winter, something more than mere planting, tilling and pruning has been required; the work of hands alone could never have materialized into the grand results of to-day; it had to be supplemented by the work of brains; thought has guided the hand, and thought itself has been cultivated and strengthened by your annual meetings like this; meetings where experiences have been exchanged, discoveries disclosed, lessons taught and learned, and where, by friendly intellectual controversies, you have been made stronger and better for your future work.

I feel warranted in likening this meeting to a council of war. Since your last council you have been doing active campaign work. Each one of your experimental stations a fort; each farm where fruit growing was attempted an outpost; every worker in the cause a soldier and hero. Another season of aggressive warfare with the powers of earth and air has closed. You have retired within your fortifications, are entirely upon the defensive. Your tenderly cared for plants are now prone upon the cold, but not unkind, bosom of Mother Earth, getting, you feel sure, sufficient protection to enable them to reward you during the coming season; your trees are protected by your prayers, all you can do for them, and now, while the habitations of the children of your labor and solicitude are being assailed by the “cavalry of the winds, and the infantry of the snows,” while

your "dearest foe" is doing his worst, you come together to rejoice over successes, deplore failures, consult as to ways and means of tempering the tree to the fierce wind and cruel frost; about adding a choicer sweet to the product of the vine, greater size to the berry, a richer blush to the cheek of the apple, and carrying your conquest a little further towards the realms of eternal snow; you are here to be told of successes which will delight you, that is human; to be told of failures which will sadden but not dishearten you, that is heroic!

You certainly will not accuse me of flattery when I characterize the labors of this Society as heroic. The highest type of heroism is a persistent struggle towards a definite end — which is to be fruitful of good to humanity — regardless of failures, disappointments and losses. You who have never experienced the pang, can have no conception of what it is to lose — by some sudden climatic freak — a favorite fruit tree; one which you tenderly planted, carefully nursed, solicitously watched; a tree that with each succeeding year bore a richer crop of hope, as it neared the time for bearing the more material product; then came the full fruition, the red-ripe gift from Pomona, plucked from the gracefully bending boughs, the first born of the holy wedlock between your intelligent labor and patient waiting. As the first lisped "papa" or "mamma" is the mystic password which admits your babe into hitherto unoccupied recesses of your heart, so does the taste of the first fruits of the tree you have planted, tended, watched, introduce you to sensations new and strange, and inspires you with an affection you never believed you could bestow upon an inanimate and so commonplace a thing as a tree. As time goes on, the tree flourishes, grows in size, beauty and fruitfulness; you begin to regard it as a part of yourself; with much satisfaction you contemplate that each additional wrinkle on your aging face has its fellow in an annual circle within the trunk of your favorite tree. You feel that it is not only going to be a solace to you in your old age, a comfort and a joy to your posterity but a monument to yourself, of which you will be vastly more proud than of the tallest shaft of richest marble.

But now comes a frost — "a killing frost" — and when you think, good easy man, full surely your tree is an "ironclad," nips its root and falls, as do your hopes, and the well-directed labors of a lifetime. Who can blame you if you exclaim, as did Wolsey, "vain pomp and glory of this world, I hate ye!"

Or, if like Lear, for one awful moment, you rebel against Omnipotence, and curse the elements! But the faithful, sturdy horticulturists of this "frozen North" are made of "sterner stuff" than this. The fate of the one tree I have noted has been duplicated in thousands of instances; the effect upon the heart, the sentiment and the resolution has been multiplied innumera- bly, yet it did not discourage, did not daunt the spirit of many of the old soldiers of the orchard, vineyard and garden, who had enlisted for the war and knew not the bugle call of retreat, nor recognized the sensation of defeat. Old men, whose whitening hairs and failing strength proclaimed the probability of their never tasting the fruits of their present labor, again planted with the enthusiasm of youth, thankful if they could have it said of them after death: "He was one of the grand old workers to whom we are now indebted for our glorious heritage of fruit, in a region where the elements had evidently denied such a boon.

Now, in conclusion, I want to say that such devotion to a cause, such persistent effort in the face of disappointments and failures, such indomitable courage, such intelligently directed labor, such patient waiting, and unconquerable energy can never find full, complete, entire fruition until we see the north pole festooned with fruits, flowers and vegetables *grown on the spot*.

REPORTS FROM LOCAL SOCIETIES.

The secretary then read the report of the secretary of the Hennepin County Horticultural Society and Market Gardeners Association.

REPORT OF THE HENNEPIN COUNTY HORTICULTURAL SOCIETY AND MARKET GARDNERS ASSOCIATION.

To the Secretary of the Minnesota State Horticultural Society:

There has been little in the transactions of the Hennepin County Horticultural Society and Market Gardeners Association during the past year to elicit any special comment. The meetings have been well attended. Papers bearing upon many of the subjects which form the aim of the society have been read. Several of these papers have been of unusual interest, and it is to be hoped will find a place in your report, as the facts therein stated should be

placed as prominently before the public as possible. Notable among these papers are the following: G. S. Woolsey in an article entitle "The Propagation and Cultivation of the Strawberry." Another by C. L. Smith on "Strawberries and their Cultivation." One by N. H. Reeves on the "Formation and Management of Hotbeds." One by J. J. Nudd upon the "Successful Raising of Celery in Minnesota."

The weekly meetings of the society have been well attended. In order to reawaken the society to increased usefulness, the matter was broached of having a meeting of the society during the latter part of January and securing as speakers for the occasion men of wide reputation in the branches in which the society is particularly interested. With that end in view the secretary corresponded with several gentlemen who were unable, however, to accept the invitations on account of the pressure of other duties. The object of this endeavor was to stimulate the public to new interest in the pursuits of the Horticultural Society and Market Gardeners Association of this State, and to allow Minnesota Horticulturists to become personally acquainted with those of other states.

The annual address from the president, J. S. Gray, contained several suggestions that are of great importance. One being that necessary steps be taken to enforce the laws prohibiting the destruction of insect-eating birds, and that the importance of taking steps to nullify as much as possible the ravages of insects, who yearly destroy crops to the value of one-fifth of the entire agricultural production of this State, be urged upon the legislature.

The annual meeting of the society, held Saturday, Jan. 9, 1887, resulted in the election of the following officers for the ensuing year:

President — J. S. Gray.

Vice President — Wm. Lyons.

Secretary and Treasurer — Prof. L. Asire.

Respectfully submitted.

J. E. NORTHRUP.

The secretary then read the following report:

OLMSTED COUNTY HORTICULTURAL SOCIETY.

To the Secretary of the Minnesota State Horticultural Society:

The annual meeting of this society for the election of officers and the transaction of other business was held at the City Hall in the city of Rochester, on the eighth of January, at 2 o'clock P. M., President A. W. Sias in the chair.

The meeting being called to order thereupon the president read his annual address; also read a letter from S. D. Hillman, of Minneapolis, upon the subject of fruit culture, and an interesting and instructive paper by J. S. Harris upon the subject "Insects Injurious to Vegetation."

After a general discussion upon the subject of small fruits the meeting proceeded to the election of officers for the ensuing year, with results as follows:

President—A. W. Sias.

Vice President—J. D. Swain.

Secretary—M. J. Hoag.

Treasurer—Wayland Stedman.

Executive Committee—J. D. Swain, M. J. Hoag, Wayland Stedman.

Librarian—Mrs. E. Stansbury.

The treasurer's report was read and accepted.

Receipts, \$9.30; disbursements, \$8.25; balance in treasury, \$1.05.

Meeting adjourned *sine die*.

M. J. HOAG, *Secretary*.

The following report was read by the secretary:

MCLEOD COUNTY HORTICULTURAL SOCIETY.

GLENCOE, MINN., Jan. 17, 1887.

S. D. Hillman, *Secretary, etc., Minneapolis, Minn.,*

DEAR SIR: As the storm prevents my being with you tomorrow, I will send you by to-day's mail a brief account of our last annual meeting. As provided by our constitution, the annual meeting of the McLeod County Horticultural Society was held the second Tuesday of the present month in G. A. R. Hall, this city. The meeting was called to order at 2 o'clock P. M.

President Cutler presented an annual address, which was full of encouraging advice. Mr. Benjamin, of Hutchinson, told how he had succeeded and failed in his twenty years of experimenting in fruit growing. "Notes by the Wayside," a paper read by President Cutler, was full of interest to the society. The reports of secretary and treasurer showed an increase in members to twenty-six, and a balance in treasurer's hands of seven dollars and ninety-two cents. The officers of last year are retained for the ensuing one, as follows:

President—Milon Cutler, Sumter.

Vice President—H. Getchell, Glencoe.

Secretary—H. I. Corson, Glencoe.

Treasurer—J. Nobles, Glencoe.

Executive Committee—Carl Hagan, Sumter; Dr. Benjamin, Hutchinson, and Jacob Koons, of Penn. Respectfully,
H. I. CORSON, *Secretary*.

RAMSEY COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

S. D. Hillman, Secretary, etc.:

The Ramsey County Agricultural and Horticultural Society has about fifty-five members, and the meetings are held on the third Saturday of each month, at Turner Hall, St. Paul. At those meetings papers are read and discussed on various subjects pertaining to agriculture and horticulture. The society always did exhibit at the state fairs, at Rochester, Owatonna and St. Paul, and generally was awarded first premium for the best exhibit of agriculture made by any county, and in 1885 was awarded the silk banner valued at \$150, which actually makes it the banner society of the State. In 1886 the manager of the state fair very unwisely barred our society from competing for any premium offered for county exhibits. The matter was discussed at one of the meetings and it was resolved that neither the society nor any of its members would exhibit at the state fair of 1886; consequently most of the space set apart for vegetables was vacant, and the visitors to the state fair were deprived of seeing one of the finest displays of vegetables, fruits, etc., ever made in the State, which the society would have made had it not been barred.

At the meeting held Feb. 19, 1887, E. F. Lemke, Peter Bohland, Nich. Pothén, Aug. Giesmann, Peter Hahn and Fred. Spangenberg were appointed a committee with power to purchase a lot in St. Paul for the purpose of erecting a hall thereon, in which, when completed, the meetings, fairs, etc., will be held.

At the last annual meeting the following officers were elected:

President — Adam Bohland.

Vice President — Nich. Pothén.

Secretary — Louis Edlefsen.

Financial Secretary — Fred Spangenberg.

Treasurer — August Giesmann.

Executive Committee — Aug. Richter, F. W. Muller and Chas. Bunde.

Respectfully yours, etc.,

ADAM BOHLAND, *President*.

The secretary read the following report:

MINNESOTA VALLEY HORTICULTURAL SOCIETY.

Mr. President, Ladies and Gentlemen:

I have but a brief report to present. The Minnesota Valley Horticultural Society is yet alive, and though scarcely two years old it has attained a growth far beyond our most sanguine expectations as to the interest manifested, and is fully up to our anticipations as to numbers. We have now one hundred and twelve members in good standing, being a gain of forty-four since our report of last winter; and I would say here that our strength is augmented by the increased membership of the past year far beyond what the mere numbers would indicate. Our membership of two years ago was obtained by persistent effort, and for the purpose, mainly, of trying an experiment, while those of the past year came in almost without an effort, and are mainly men and women of mature age and of ripe experience in that which is of the most importance to us as a society.

We held our summer meeting on the thirtieth of June, in a grove. Mr. J. S. Harris, of La Crescent, was in attendance at that meeting, and added very materially to the life and interest of the occasion. And here allow me to make a brief quotation from the minutes of that meeting:

"At 2 o'clock P. M. Mr. Harris took up the subject of horticulture, mapping out the whole field which the subject

embraces—which is indeed a wide one—and closed by giving an object lesson in budding fruit trees. Then followed a shower of questions from the audience on the various topics presented, which were answered by the speaker to the entire satisfaction of the people.”

We held our second annual meeting in Winter's Hall, in Granite Falls, on the twenty-eighth and twenty-ninth of December last. We held five sessions, three the first day and two the second. At 2 o'clock P. M. of the second day the following officers were elected for the ensuing year:

President—O. E. Saunders.

Secretary—A. B. Regester.

Treasurer—W. J. Rice.

Vice Presidents—J. Cook, J. J. Mooney, Mrs. H. E. Morrill, Mrs. S. A. Hall, C. A. Sargent.

Directors—J. B. Smith, A. W. Knox, Mrs. O. E. Saunders.

The young ladies and gentlemen are becoming interested in horticulture through the influence of our society, and are taking hold of the work in good earnest. Let me relate an incident: Prof. Hall, of Wood Lake, was booked for a paper on the cultivation of potatoes, to be read at our winter meeting, just past. Mr. Hall was unable to attend the meeting, so he got his son, about eighteen years old, to prepare the paper and read it in his stead; and while this paper was being prepared a younger son, a little boy but seven years old, asked his father the privilege of writing a paper on potato culture. Consent was given on condition that he should write it himself and read it at the meeting. The paper was written as per agreement, and when his turn came to read the little fellow stood up by his mother's knee and read his paper like a little man, and the hearty applause which followed showed not only an interest in the subject presented but in the manly courage of that little boy; and let me say, as a matter of fact, that the subject of potato culture presented by those boys called out more interesting discussion than any other subject presented during the sessions of the meeting.

Now a word on the good work accomplished by our society. It has created an increased interest in fruit culture and general horticultural work; it has stimulated a desire to plant more ornamental and forest trees in our public grounds and along the highways. The county superintendents of schools in Yellow Medicine and Chippewa counties have agreed to work up an in-

terest in the adornment of school grounds in their respective counties, and as the president of our society is the superintendent of schools in Chippewa County, we look for grand results in that direction. And as further evidence of prosperity, I will state that near the close of our last meeting, and at the close of the discussion following a paper on canning fruits by Mrs. O. E. Saunders, a committee was appointed to investigate and ascertain as far as possible the best known methods of canning fruits and vegetables, and report at a subsequent meeting. This opened the door for committees, resulting in the appointment of six additional committees to take charge of and report upon as many parts of the work in hand, including one upon horticultural fairs either in connection with our agricultural society or otherwise.

Perhaps a word as to our finances will be in place here. The treasurer's report showed a balance in the treasury of six dollars and seven cents, which, added to six dollars and seventy-five cents obtained as membership fees at the meeting after the treasurer's report was in, gave us twelve dollars and eighty-two cents; but, as was the case last year, the treasury will be nearly emptied by our attendance at the meeting at St. Paul this week. A membership fee of twenty-five cents is but barely sufficient to meet our expenses, keeping us on the ragged edge of bankruptcy, but we dare not raise the fee till we get more firmly established, so that we can afford to lose the few that may be sacrificed by the change. Thus we have fairly started with a hope that we may not run at a rate of speed beyond our powers of endurance nor take upon ourselves burdens which we can not carry through.

A. B. REGISTER, Secretary.



CORRESPONDENCE.

FROM CALIFORNIA.

SAN DIEGO, CAL., Dec. 4, 1886.

S. D. Hillman, Secretary, etc.

Yours of eighteenth ult. came to hand a day or two ago and contents noted. In reply will say I would like the books you speak of, but can not very conveniently drop in and get them at present. In regard to the books Prof. Winchell wishes, I will say I have no objections; do as the rest of the committee, yourself and President Elliot, wish, and I will be satisfied. I have been here since November 23rd, and I have been busy all the time. My wife says she can not hardly get sight of me during the day. I have been looking after ranches, orange groves, vineyards, lots, etc.; there is a whole army of real estate agents here, and they are so anxious to show and sell property that I have lots of free rides and plenty of chances to see and learn about the farms, ranches, vineyards and city lots, and if you and President Elliot wish, I have no doubt but that I could get donated for exhibition at the winter meeting a fine box of fruits from this country, and if by chance I should buy a fruit ranch, I would be glad to contribute my share.

I have been here with Wm. E. Brimhall, W. B. Quinn and their wives five weeks to-day, and they say they have not seen but one cloudy day since they came. Mr. and Mrs. Quinn have no fire in their rooms. We have a nice sunny room and fireplace and have a fire nearly every morning and evening. There is some fog early, but most of the time it is bright, pleasant sunshine and has been from 50° to 80° in the shade; they have no frost except on low grounds and in valleys. I have talked of buying two lots containing ten and thirty-seven one-hundredths acres, all set in fruit and mostly in bearing. I shall know within two or three days. There is the finest fig orchard I have seen; orange trees loaded with fruit; lemons, limes, apricots, almonds, plums, olives, grapes, English walnuts, apples, pears, etc. I should like to take you through the place and show you. There are wind-mills and steam engines for pumping, three or four wells and

plenty of water, with iron pipes laid all over the grounds for irrigation, but of course I have to pay well for it all.

There is more building now going on here than in any city of its size I ever saw, and you know I have seen both St. Paul and Minneapolis grow up from smaller towns than this now is. The climate, the weather, the beauty of scenery, the bay, the ocean, the best harbor on the Pacific coast all tend, with the fruits and flowers, to make the place attractive. I have seen bananas growing here, heliotrope and roses, morning glories and many other flowers are common in most yards; such geraniums as we saw yesterday and such cactus as we saw growing wild; two were at least fifteen feet high and one I should judge was twenty-five feet high!

Pardon me for thus intruding upon your valuable time, but I so enjoy the bright flowers and warm sunshine after leaving St. Paul November 17th in that terrible snow storm and lying snow bound all night at Manly Junction, Iowa, that I can not help speaking of it and the contrast. I do not think after this you will wish me to write anything for the meeting, but will try and send some fruit for exhibition if you and Mr. Elliot wish it and think it would be of interest to the Society, as you know you all have my best wishes for the success of the Minnesota State Horticultural Society.

Yours sincerely,

TRUMAN M. SMITH.

FROM L. M. FORD.

SAN DIEGO, CAL., Jan. 7, 1837.

Friend Hillman:

I have just received, by way of Los Angeles, where we lived until four weeks ago, your program for meeting of State Horticultural Society.

Mr. Brimhall, who also lives here, suggested the idea of writing you something, which please find inclosed. Do what you like with it, and tell all my old friends, including the father of Minneapolis (Col. Stevens), to come down and see us.

Truman M. Smith is here, as well as Brimhall, Quinn and many others.

We all sympathize with those who live in a land of blizzards, cyclones, and thunder storms.

Yours truly,

L. M. FORD.

P. S.—I forgot to include mosquitoes and bedbugs, which do not trouble us here.

FLORICULTURE IN SOUTH CALIFORNIA.

By L. M. Ford, San Diego, Cal.

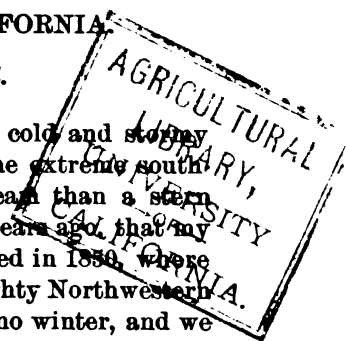
To one who has resided so many years in the cold and stormy North, the change from St. Paul, Minn., to the extreme southern end of California seems more like a dream than a stern reality. Nor did I ever dream, even three years ago, that my home, as well as that of some others who settled in 1850 where now is growing up the great dual city of the mighty Northwestern Empire, would now be where there is really no winter, and we only use the term from force of habit.

Two years ago, some letters from this State, by a fair correspondent of the *Pioneer Press*, attracted my attention, and being quite unwell, I was only too glad to learn more in regard to a land where the floral treasures I had so fondly cared for in the greenhouse were wont to revel in their beauty, every month in the year, and after a manner that can not be equaled in the finest bay window or conservatory. Where, too, the delicate hummingbird and the "busy bee" are seen, both in June and January, gaily flitting from flower to flower, in search of the nectar they love so well.

And now that I am here and have seen with my own eyes the wonderful product, of this incomparable land, I can most truthfully exclaim, with the poet, "December's as pleasant as May."

Here in San Diego it is not an exaggeration to say that the last month of the twelve is far more pleasant than May in the land where I was somewhat busily engaged in horticultural work for more than a third of a century, though in looking back it all seems but a few brief months.

In Minnesota, as all know, it is not deemed safe to set out our tenderest plants until the last of May or first of June, while here it's a rare thing for even alternanthera to be killed by frost, except in low places. An old settler tells me his Poinsettia pulcherrima has been injured only three times during a residence here of fifteen years, while such things as geraniums, verbenas, abutilons, roses, pansies, petunias, habrothamus and most greenhouse plants that endure a little frost, are never killed but grow to an immensesize. Indeed some things we used to know only as little pot plants, here become quite large trees. This applies to lantanas, hibiscus, flowering maples, habrothamus, oleanders, roses, and some others, while the heliotrope can often be



seen at the top of a two-story house, in good soil and proper training.

This climate can be readily understood by those who never saw California, if they will bear in mind the great fact that most of our wind is from the Pacific Ocean, which in this latitude varies in temperature only two or three degrees the year round. Hence, near the coast, July is only from twelve to fifteen degrees warmer than January.

As the earth is warmed by the sun, the heated air rises and cooler air comes from the bay, so it never gets very hot. After sundown, when the land is cool, a current comes from the east to fill the vacuum on the water where it is warmer, and air rises in accordance with a well-known law of nature.

The high mountains on the north and northeast prevent cold winds from sweeping down upon us, which is another cause of our exemption from frost. These are the reasons, in a nutshell, why there is really summer the year round in Southern California, near the coast, while snow may be seen on our highest mountains nearly all the year. It is not to be wondered at, therefore, that it is the home of Flora, as well as Pomona.

But our Eastern friends must not think all these choice things from even the tropics, as well as semi-tropics, are had without labor. Even the Garboursien had to be tended and carefully cultivated; so here we give them plenty of care, not only cultivating and weeding, but what is most essential, the watering during the many rainless months. After the winter rains begin is when South California is most attractive and when most visitors come to see her wonderful products, not only of choice fruits, but all the charms of our beautiful Flora that are seen on every hand, both wild and cultivated.

SAN DIEGO, CAL., Jan. 6, 1887.

FROM WASHINGTON.

WASHINGTON, D. Dec. 29, 1886.
 U. S. DEPARTMENT OF AGRICULTURE. }

*Division of Pomology.**S. D. Hillman, Secretary, etc.,*

MY DEAR SIR AND FRIEND: I see by a recent circular from your office, received by this department, that there will be a meeting of the fruit growers of your State, at St. Paul, Jan. 18 to 21, 1887.

It would afford me great pleasure to be present on that occasion, were it not for the urgency of business here. This division, so recently established, has only just sprouted, and if it is to grow into a fruitful tree, it must be tenderly cared for now in its early stages. I shall not be able to leave the office for more than two or three days at a time, until I get things into good working order. But it is my desire to visit your State and personally acquaint myself with your conditions in some degree, and if possible, put this division in living, working relations with your Society and people.

Anything that we can do will ^{be done} with pleasure. Let me suggest that you mention in your ^{letter} ~~letter~~ ^{expressing my earnest desire} to receive information concerning new ^{plants} ~~plants~~, and specimens of the same whenever possible. Can you not send me a box of specimens correctly labeled, and with name of the growers, to study and compare with those from other states, and to place on the table in this office, to show to visitors as coming from Minnesota.

Yours fraternally,

H. E. VAN DEMAN,

Chief Pomological Division.

A letter was also read from Mr. Van Deman relative to changing the date of annual meetings of this Society, and others, so as not to conflict in that respect.

FROM CANADA.

ABBOTTSFORD, QUE., Oct. 25, 1886.

S. D. Hillman, Secretary, etc.:

Please except my thanks for copy of Minnesota State Horticultural Society. As your climate is even more trying than

ours, your reports are read with great interest by us. I have been absent in Russia again, or would have replied before.

Yours truly,

CHAS. GIBB.

Also the following, under date Nov. 8, 1886:

Your kind letter of the thirtieth of October I find yet unanswered. I am doing my best to get through with some horticultural and other correspondence so as to give my entire time to some other matters, and I regret I can not promise you anything for your Minnesota meeting. I am over busy now. Please excuse me, as it is not want of will. Yours truly,

C. GIBB.

On motion of Mr. Sias, Mr. Gibb was made an honorary life member of the Society.

FROM MICHIGAN.

The following letter from T. T. Lyon, president of the Michigan State Horticultural Society, was read:

SOUTH HAVEN, MICH., Dec. 29, 1886

S. D. Hillman, Secretary, etc.:

I am under obligations for a copy of your program for the twentieth annual meeting of your State Horticultural Society. I was greatly interested, not to say surprised in looking over the exhibit of fruits from your State, at the New Orleans Exposition, and especially so to see among them well-ripened Catawbas, a variety whose home proper is in the Ohio Valley, and which we in Southern Michigan only ripen with certainty in our more favorable localities.

It would be a great pleasure to me to be with you and to learn how this is done, and to make the acquaintance of the horticulturists of your State; but I regret to say that press of other duties at present render this impossible.

Wishing you the compliments of the season and trusting that your gathering many prove both pleasant and profitable.

I am, yours respectfully,

T. T. LYON.

FROM WISCONSIN.

Mr. Tuttle, of Baraboo, sent specimens of apple wood and the following letter in reference to the same.

BARABOO, WIS., Jan. 15, 1887.

S. D. Hillman, Esq.:

In showing the blocks of wood, show the old varieties of American apples by themselves, and the old Russians and crabs by themselves. In this way the relative hardiness is better shown.

I should like very much to be at your meeting, but expect to be at the Iowa meeting, which occurs at the same time. Every year strengthens my faith in the Russians, and I have no doubt we shall see healthy orchards scattered throughout the whole prairie region of the Northwest. Yours, etc.,

A. G. TUTTLE.

LIST OF APPLE WOOD.

Following is the list of varieties included in specimens:

Crabs: Hyslop, Transcendent, Brier's Sweet, Whitney No. 20.

Old Ironclads: Pewaukee, Walbridge, Uppers, Red Astrachan, Golden Russet, Willow, Fameuse, Plumb Cider, St. Lawrence.

These blocks were cut from the best tree and the best limb on the tree, of the old sorts.

Twenty-five Russian and one American variety; classified as to relative hardness as lists 1, 2 and 3.

List 1: Garden, Hibernial, Arabian, Vassilis Largest, Yellow Anis, Blue Anis, Red Anis, Charlamoff, Repka, Enormous, Zuzoff, Early Glass, Switzer.

List 2: White Krim, Beautiful Arcade, Sugar Barbel, Golden White, Lord's Apple, Glass, Green Transparent, Early Champagne.

List 3: Longfield, Alexander, Borsdorf, Duchess; Wealthy, American.

These blocks are a true sample of the trees, and came from orchard trees which have been bearing five years. Trees have been set ten years and over.

FROM GEO. P. PEFFER.

PEWAUKEE, WIS., Dec. 2, 1886.

S. D. Hillman, Secretary, etc.:

Your letter of November 20th was received on 29th. Yes, I see that the paper I sent to last winter's meeting caused discussion and fetched out some facts, so that the public will find that there is as much risk in planting Russian varieties as any others. I still hold to it that our fruit trees, to give satisfaction, have to be grown from seed raised in about the same latitude and neighborhood where wanted.

I shall probably attend your meetings this winter, and hope to see many of our fruit growers.

Cordially yours, GEO. P. PEFFER.

FROM F. K. PHOENIX.

DELAVER, WIS., Dec. 28, 1886.

Friend Hillman:

Thanks for notice of winter meeting. I beg to ask if your Society has sufficiently worked the Ironclad seed-saving and sowing, the Ironclad seedling-growing and testing scheme, as the best, surest, swiftest way out of this wilderness of tender varieties.

A prince fitting up a magnificent new estate had already spent fifty years and fabulous wealth in vain. At last he called on a very modest master workman, of whose wondrous skill he had before heard. "Can you do this job?" said the prince. "I can," was the quiet answer. "For how much money?" said the prince. The master answered, "I work not for money." "Wherein is the cost, then?" asked the prince. "In patient care and heed taken to follow my every requirement. First and foremost, I must have the help of every tiller of the soil we can enlist on your wide domain. I do no hasty, botch work." "How long might it take?" queried the prince. "That depends on the number of your workmen and their careful attention to my instructions. That job will take 10 or possibly 20 years." "Ten or 20 years longer!" echoed the astonished prince; "have I not already spent 50 years at it? And what good will your help do me 10 or 20 years hence?" The master's last answer came: "Remember the 50 years' time, the wealth and hopes already wasted — and then, your children!" The prince went

sadly away, muttering, "Ten or twenty years longer to wait—he wants no money!" My last view of the prince was, drunken and stripped of his last farthing, among a crowd of overjoyed tree peddlers.

F. K. PHOENIX.

FROM IOWA.

The following letters from Prof. Budd of the Iowa Agricultural College at Ames, were then read:

AMES, IOWA, Dec. 1, 1886.

S. D. Hillman, Secretary, etc.,

MY DEAR SIR: Your program at hand. I much regret that I have not been able to meet with you and talk over our mutual successes and drawbacks. But year after year your annual meeting and ours come on the same days. Our time is fixed by law. Is yours? If not will you try and arrange for an earlier or later date next year?

Yours,

J. L. BUDD.

AMES, IOWA, Jan. 4, 1887.

MY DEAR SIR: Your favor at hand. I am also anxious to attend our meeting at Charles City.

This Russian fruit question has several aspects. In the north half of Iowa the old list dropped down to the Duchess, Tetofsky, and Wealthy. I believed six years ago, and am stronger in the belief now, that East Europe had many varieties of really good apples for all seasons, and many sorts of pears, cherries, and plums, which would give perfect satisfaction in the north half of our state, and some of them in your state and the north half of Dakota. Acting on this belief, we have imported cions, grown trees, and sent them out for trial as wisely as we knew how. We did not expect them all to succeed, but out of them we did expect to secure a few treasures. We keep a careful ledger account with each variety we have sent out, and some of our friends who scold at the meanest of the varieties in quality, such as the Hibernial, Lieby, and Silken Leaf (No. 327 of Dep't. list), will be surprised if they spend a day looking over the reports from our many sub-stations in regard to the perfection of tree and quality of fruit of very many of the new-comers from East Russia which have not yet fruited in your state that I know of. As

instance the varieties of winter apples we obtained from the Bogdanoff estates in Central Russia seem quite as hardy as Hibernial, yet their quality is not far behind that of the Baldwin. But I did not intend to talk of varieties.

Another phase of the subject is that of judicious crossing for the south half of Iowa, and indeed for all parts of our state and a larger part of yours. We made successful crosses last spring of such choice sorts as Jonathan, Grimes Golden, Roman Stem, and Northern Spy, on Hibernial, Lieby, Silken Leaf, the Moscow cross apple, Astrokoff Glass (our 361), and other true ironclads, as reported from all our stations. We shall continue this work, and I hope you will commence it in your state as soon as possible.

If you cannot get pollen at home of best winter sorts, you can introduce it in ample time from Southern Illinois, Iowa or Indiana. Apple pollen we find to germinate perfectly after it has been sent in a letter across the continent and then kept in a dry room for two weeks. From my experience and observation in Europe and America, we can rest assured that when the mother stock is a fixed type of undoubted hardiness for a given section, the hardiness of the crossed seedling will, in nine cases out of ten, follow the fixed ironclad mother and the fruit in quality will follow the less perfectly fixed male. The season may also follow the mother type, hence our attempt to use those maturing their fruits late. I will only add that artificial crossing is a simple operation which a child may understand and accomplish; hence the day of chance crosses should become a thing of the future.

I did not intend to say so much.

Yours fraternally,
J. L. BUDD.

FROM WABASHA COUNTY.

PLAINVIEW, MINN., Jan. 15, 1887.

S. D. Hillman,

DEAR SIR: In reply to your request, would say. We had in this vicinity an abundance of apples. Small fruit was not plenty, owing to the drought. I have the Telford Sweet; it is a crab, it came into bearing this year; it is of fine quality, and we have some of them now. The tree seems to be perfectly hardy. I have a neighbor that has a small nursery; he has from crab seed, eight

varieties of winter apples of fine flavor. They came into bearing this year.

Yours truly,
GEO. W. HARRINGTON.

FROM OLMSTED COUNTY.

DOVER CENTRE, Jan. 15, 1887.

DEAR SIR: Very much obliged for your invitation. I would very much like to attend the meeting and see old familiar faces and have a pleasant time, but as the twelfth of this month was my seventy-second birthday, it is not quite as easy to leave home as formerly; otherwise I should come. I hope you will remember me when you distribute reports, for, although getting old, I feel interested as usual. Should you ever come near our neighborhood, come and see us.

Yours in friendship,
R. L. COTTERELL.

FROM CLAY COUNTY.

ARGYLE, Oct. 7, 1886.

S. D. Hillman, Secretary, etc.,

DEAR SIR: I write you in reply to yours, and to express my thanks and pleasure in the receipt of report of meetings of State Horticultural Society, experimental station reports, etc., which I am reading with pleasure and profit.

Our country here being so new but little has been done in fruits or forestry, but the future will change all this to the benefit of both the pocket and health of our people.

I do not know that I could write anything of interest for your State meeting, as my work has necessarily been experimental and on a small scale. And the past summer proving so dry and disastrous to all fruits, I could not speak encouragingly except for the future.

Hoping, however, to make the acquaintance of yourself and the members of the State Society, if opportunity permits, I again thank you for your kindness. Respectfully yours,

CHAS. T. OHMER.

FROM COTTONWOOD COUNTY.

BINGHAM LAKE, MINN., Dec. 13, 1886.

S. D. Hillman, Secretary, etc.,

DEAR SIR: At the request of C. L. Smith, institute lecturer, I send you my experience in orcharding in Cottonwood County:

In the spring of 1878 I purchased from the Phoenix Nursery, Bloomington, Illinois, 3,000 Wealthy, 1,000 Duchess, and 1,000 Tetofsky apple root grafts; also 1,000 Scotch pine, 1,000 arbor vitæ, 500 balsam fir, and 500 spruce seedlings from three to four inches in height. The site selected was a southeast slope. The soil a dark loam, ranging in depth from six inches at the northwest, to three or four feet at the southeast. This was prairie soil; no native timber in the vicinity; had been in cultivation six years; was plowed about six inches deep the preceding fall, and about eight inches again in the spring, after having about three inches of well-rotted stable manure spread over it. It was then thoroughly harrowed and marked out with plow in rows four feet apart and the apple root grafts set in the furrow and the loose dirt drawn around them with the hand. The furrows were then filled by drawing the earth into them with a hoe, the earth being firmly pressed around the roots by tramping.

The evergreens were taken into the field where they were to be set in the original box in which they were received from the nursery. The cover of the box was removed and fine dirt was sprinkled over them and worked down among them and water poured over them, so as to puddle them before taking them out of the box. They were then taken out and treated the same as the apple trees. Of the apple trees, I think nine-tenths of the Duchess and Wealthy scions grew; of the Tetofsky only about a dozen out of the thousand grew.

I have never known one of these apple trees to be killed by climatic causes. I have found in pruning a few limbs that were black in the centre, this being the only indication of disease I have noticed. A few of the Duchess and Wealthy have borne the last two seasons, but the Tetofskys are not over five feet in height, and have not shown any signs of bearing.

As to the evergreens, I lost all the spruce and firs and about ninety per cent of the arbor vitæ the first summer, and the balance of the arbor vitæ the second summer. But of the

Scotch pine I only lost twenty-three in a thousand. The pines stand now from ten to twelve feet high, and from four to six inches in diameter, and of course make a magnificent wind-break.

If there are any points in my experience as given that are of any value to the student of horticulture in Minnesota, I am happy to give them. Yours truly,

S. O. TAGGART.

FROM DAKOTA.

DEADWOOD, DAKOTA, July 24, 1886.

I have quite an orchard set out at my ranch, and expect to have over a barrel of apples this year. I have derived great benefit from reading accounts in *Pioneer Press* of your annual meetings and reports. I think this country, in the immediate vicinity of the Hills, is admirably adapted to horticulture.

Yours truly,

WM. SELBIE.

The following paper was then read:

COLD IS KING.

HOW MODIFIED IN THE COLD NORTHWEST.

By E. H. S. Dartt, Owatonna.

Cold is king! His realms are too extensive for human conception. He envelops the whole earth in a vast mantle which though forced up a little at the equator, gradually settles towards the North and South, till it seems frozen fast at the poles. As a king he is fully able to enforce his mandates. He has said to man, "thus far and no further." And the almost superhuman efforts of rebellious man have not yet enabled him to reach the North Pole.

He has fixed the northern limit of the cotton belt, the corn belt and the apple belt, and if we attempt to force these limits further north we can not expect greater success than those who have labored in vain to reach the North Pole.

Although the northern limit for the successful cultivation of

the standard apple has been definitely fixed, yet the line has not been marked with sufficient clearness for our comprehension. And as the indications now are that we are pretty near that line it seems best that in our efforts to find and follow its intricate and crooked ways, we admit that cold is king and govern ourselves accordingly.

MODIFICATIONS.

If our country was a dead level, and we had no winds or bodies of water, or timber, and the earth's axis was perpendicular to the ecliptic, then lines of latitude and isothermal lines would run parallel, cold would increase towards the north one degree Fahrenheit to one or two degrees of latitude. And if under these circumstances we had just one high mountain cold would increase with altitude one degree to two or three hundred feet. Hence other things being equal latitude and altitude will determine the degree of cold to a certainty. But to understand these other things, there's the rub. For with ocean breezes from the west, bent, twisted and modified by ranges of mountains and counter currents, with our blizzards from the north meeting and commingling with balmy breezes from the south, with the warmth absorbed by the earth ascending and cold from its unbounded and indescribable realms above descending, with the influences of different soils, bodies of water, timber, and electricity, we have a most discouraging complication and it is not strange that the facts we have observed should sometimes contradict our seemingly well founded theories.

If I understand all the causes that tend to modify climate and all the counteracting influences it would require a volume to fully explain. I will therefore only touch upon a few points and leave the thoughtful reader to enlarge at will.

I am free to admit that I am too small for my subject. I am in about the position of a certain presidential candidate when he said the tariff was a local question. That remark was taken as an evidence of weakness; but I believe he was about half right, for its beneficial effects so clearly visible in some localities are scarcely perceptible in others. So of climate, there are potent softening influences in some sections whilst others seems to be left almost entirely out in the cold, and I have sometimes thought Minnesota did not get a fair share of warm breezes, or tariff benefits.

We are so far from the Pacific that if we get a breeze from it in winter it is liable to come by the northern route and have every particle of warmth and moisture frozen out of it. So if a breeze comes from the Gulf those Northern Iowa fellows need all the warmth and moisture and it reaches us deficient in those elements. The great lakes are on the wrong side of us, for we seldom if ever get winds from that direction. So our climate must be to a great extent just what latitude, altitude and our immediate surroundings make it.

Wind is the great equalizer and preserver of temperature. It sweeps the warm air in contact with the earth continually along the surface, not allowing it to rise up and have its place filled by cold air from above, as it would do in case of a calm in the absence of sunshine. In this way those places deprived of the direct rays of the sun by clouds or otherwise are made warmer and overheated places are made cooler, and who will say that wind does not generate heat by the friction of the particles of matter of which it is composed either among themselves or by being forced against obstacles? Does not the mercury *always* touch its lowest point in the absence of wind. We know that a suffocating heat is present in the cyclone. Is this caused by the great velocity of the wind or is it an incipient state of electricity which produces heat and an immense power without producing the electric spark? Who will analyze the cyclone and define its constituent elements?

To judge of the value of wind to the fruit grower we must consider the source from whence it comes. If it has passed over a long stretch of high level prairie it will be far less beneficial than if it has passed over an equal extent of low-lying country abounding in streams, lakes and forests. If our Mississippi Valley extended from southwest to northeast so that prevailing winds would sweep it lengthwise it would be better adapted to fruit growing than it now is. Lake Minnetonka alone is not sufficient to give to that region its notoriety as a fruit-growing section. It has the additional benefit of winds from the valley of the Minnesota from Mankato down, and to the west there are moderately elevated timbered lands with numerous lakes and not very far off the valley of the Minnesota again. Now, suppose we could elevate Minnetonka four or five hundred feet, bringing it up to the level of our central, southern and western high prairies, let the Minnesota River be dried up, fill up the valley and remove the forests so that there would be a broad sweep of high

dry prairie for fifty to one hundred miles south and west, then climate would be so far changed that Wealthies would likely kill to the snow line every three or four years as they now do in unfavorable sections. Then Gould and Latham, instead of exhibiting grapes so large that they are obliged to stack them in order to get five bunches on a large plate, would sneak around with grapes inferior in size and quality and most varieties green at that. Then the Mississippi Valley man would take all the premiums, and if "turn about" is fair play perhaps we had better ask that the change be made provided Gould and Latham do not object.

We now propose to consider another form of circulation of air, the upward and downward flow. In discussing this question we must exclude our usual horizontal winds; for though their mixing in would more clearly represent the actual condition of things, yet we think it best to study each cause separately as far as possible that we may the better understand the combination.

We are told that our surface atmosphere in summer is dense, moist and heavy, and that as we ascend it gradually loses these properties and becomes very light, dry and cold in the upper regions. If the reverse of this was true winter would drop down on us every night in summer, but as it is winter floats three or four miles above us and only comes down on a somewhat protracted annual visit. Cold can only reach us from the upper regions by the slow process of penetrating our atmosphere as it penetrates other substances and in short nights it has hardly time to reach the earth's surface before the sun appears and we are warmed up again. Thus our atmosphere is cooled from above every night and warmed from below every day. As we approach winter with shorter days there is less heat and with longer nights there is more cold till winter has reached us from above.

Whilst we find no cause for upward and downward currents in the upper region, yet in our surface atmosphere extending upward a mile or so it is otherwise. Here the difference in the density of the upper and lower air will not be sufficient to counteract the natural tendency of warm air to rise and cold air to settle. From overheated places warm air is constantly rising, cooler air moving forward from shaded places or settling down from above to take the place; this again is slightly warmed and rises so a current is formed which may continue till the earth has imparted most of its surface warmth and is about as cool in one

place as another provided the night is long enough. We know the moderately elevated hilltop is warmer in the night time and always of more even temperature than the adjacent valley. Why is this? Because being nearer to the cold regions it may be expected to first impart its surface heat; as this rises the warm air of the hillside moves up, perhaps from all sides, forming a current which may continue till the last warm breath is drawn from the valley and this lingers longest on the hilltop while a colder air has complete possession of the valley below. Now we know these upward currents can not exist without corresponding downward currents or a gradual settling of the upper air. Whilst we incline to the opinion that in comparatively level sections equilibrium is produced by the gradual cooling and settling process we believe in more uneven sections quite strong downward currents are often formed, which, like water, constantly seek a lower level. Starting from high elevations of land all depressions are filled, then down ravines to deep valleys and along valleys till dense woods or encircling hills stop or retard further progress, then a raising up in a lake-like form till just the hilltops may remain like islands, or if the night is long enough the whole region receives a thoroughly cold bath.

Now while I believe results tend to prove the correctness of the foregoing theories, I do not believe these upward and downward currents are usually as distinct and forcible as I have intimated, but that like the whole question of climate they are considerably mixed, not only among themselves but by cross-currents of wind, often so far above the earth's surface as to be unknown to us.

It has been my object to point as clearly as possible to the best location for the apple orchard in Minnesota. And when we find a change of temperature of seven degrees to eleven feet or twenty-seven degrees to a few rods, this question of location looms up and becomes paramount to all others and a thorough knowledge of it seems to be a necessary preliminary to successful experiment. For if we are told that some variety new or old is hardy and productive, we must ask the question, where is it hardy and productive? If it has succeeded for a series of years in such unfavorable situations as a sheltered nook in a closed valley or on the high level prairie, then we may entertain hopes of its general adaptation, if otherwise, it is likely to prove a delusion and a snare to rope in the unsuspecting granger.

DISCUSSION.

Mr. Pearce. I would like to ask you when you say "Cold is King," do you mean to say that we can not raise apples?

Mr. Dartt. No, sir; cold in his own limits—king in his own kingdom.

Prof. Maginnis. Mr. President, in regard to Mr. Dartt's paper I wish to say that it seems to me this is an important question. I have been an official in the United States Signal Service and have paid some attention to this matter of climatic influence, especially in the Northwest. I indorse what he says in regard to local influences of timber belts and forests. To illustrate, I refer to the influence which the forests of Minnesota have on its climate. Having reports of the temperature every morning, day after day, from all points throughout the Northwest, as I have had, you could see and it would surprise you to see what differences in temperature these forests make for the State of Minnesota. During the winter they are most marked. The isotherm, or line of equal heat, of five degrees above zero, in the winter in Minnesota, does not run east and west, as it should, under equal conditions. It commences about twenty-five miles northeast of Duluth, on the shores of Lake Superior. follows down the lake shore to Duluth; from there, instead of going west, it strikes directly south, and passes a little to the southeast—possibly twenty miles east—of St. Paul and on to the southern line of the State, and thence through northwestern Iowa.

Why is it that the climate in the northwestern part of the State is so cold, while in the northeastern part it is so much warmer? Simply because there are millions of trees covering the ground in the timbered sections of the State which cause the currents of cold air that come from the north to be diverted in their course in the winter months. I have known the temperature at one time last winter, when it was five degrees above zero in St. Paul, at the same time to register twenty-five degrees below zero, one hundred and twenty miles to the west of here. I have noticed these conditions were permanent, to a great extent. These cold waves come down from the northwest and strike the big woods and pass on to the south, toward the Gulf of Mexico, instead of coming in this direction. This is not speculative, but is a fact.

This is one prominent reason why the great forests of this State

should be preserved. It is one of the most important economic features in this State, because on it depends, to a certain extent, the amount of our fruit products. There is no question about it. When the last stick of timber is razed from Minnesota, you will have the same temperature in this State that ordinarily prevails in Dakota, and that is going to be decisive against many of our productions.

We all know that in Europe there are forest laws. I don't hope to have action taken by the people of Minnesota or any other Northwestern state, from sentimental reasons, for the preservation of our forests. The only reason that will cause anything to be done is the one which will show that it will pay from a financial standpoint. We are a practical people, and look too much to the present and not enough to the future. Now, I can show that if proper attention were to be paid to forestry, as is done in Europe, a revenue would be afforded, so that hardly a cent of taxes would need to be laid on other industries of the State; the forests would pay for carrying on the expenses of government and we would secure those climatic results which would make it possible to produce other desired products. This has been and is being done in other countries, and should be done here. It is not a chimerical project; it has already been tested elsewhere; it is not much credit to our civilization when we pay absolutely no attention to the preservation of our forests.

Mr. Smith. Mr. President, I want to heartily second everything that Prof. Maginnis has said. This is a very important matter. A very small body of timber will show very marked results. At the recent meeting of the Dakota Horticultural Society it was stated that a small grove of timber, twenty-five or thirty feet high, would show its effects for at least half a mile. I know that a garden on the south and east of a ten-acre patch of timber is earlier than one which has no such protection. And I think if we can invade the domain of this King Cold, by planting timber, that we ought to do it.

Mr. Harris. Mr. President, I have always felt that forestry was the forerunner of horticulture in Minnesota and in the Northwest. But it always seemed to me that it was my mission to be one of the followers of the famous apple raisers of my native state of Ohio. Forestry should, however, be the forerunner of horticulture, and since we have lost that great leader, Mr. Hodges, I don't know but some of us will have to lay aside our horticultu-

ral work a portion of the time, and devote a part of the year to forestry. If we had ten acres of timber on every quarter section in the State, with groves and timber belts about farm buildings, there would be no question in regard to raising apples in Minnesota. We ought to encourage forestry and have forests planted throughout the Northwest. It seems to me that the climatic conditions are getting more unfavorable; I used to raise fruit, but since they have been clearing the pine timber from the head waters of the Mississippi we have been suffering great losses, as the cutting away of these barriers has a tendency to bring the north winds down upon us. We ought to bring a sentiment to bear upon our state and national legislators which would cause them to protect our timber, even if they had to send an army to put these timber thieves where they belong.

Mr. Kramer. A good many years ago, when I lived in Indiana, I knew a farmer there who had no timber on his land, and he planted out ten acres to hickory nuts, planting one nut in each hill of corn. The next year he planted his corn in the middle of the rows, and took off two crops of corn. When the hickory trees were four years old they were cut and they would sprout up again, leaving three or four sprouts to each hill. He had a better crop from that land than anything else he could raise, by selling the hoop-poles.

Mr. Pearce. Mr. President, there is no question but we have made a great mistake in not propagating timber, and we have got to do it yet. I know by the cultivation of timber we increase moisture. If every farmer would expend a little money, not over a hundred dollars perhaps, in planting out trees, something that will grow and make a timber belt, he would have little difficulty in growing fruit.

The following paper was then read:

REVIEW OF THE VEGETABLE EXHIBIT AT THE STATE FAIR.

By J. T. Grimes, Minneapolis.

The twenty-eighth annual fair of the State Agricultural Society was held at the Fair grounds, Aug. 30 to Sept. 4, 1886, inclusive, at which the management, for the first time, placed the vegetable department entirely under the charge of the State Horticultural Society, the president of which appointed me to take charge of that department.

In making up my report to this Society, it will be proper to notice the decided advantage of having a permanent location for the State fair, especially in erecting permanent buildings suitable for the different displays, and otherwise improving the grounds for the purpose intended. I think the State can make no better disposition of a portion of the public funds than by the encouragement of Agriculture, Horticulture and Mechanic Arts.

Our fairs are held at that particular time of the year when the husbandman can relax his hand from toil, and wipe the sweat from his brow; when the hurry of summer has ended, and the season has crowned his labors with the luxuries of life, and with a heart of gratitude to the Giver of all good, he is prepared to show the progress attained, and what advancement in the details of industrial progress have been made the past year, and from year to year.

But I was only intending to speak particularly of the vegetable exhibit. There are some things very peculiar about it, especially in regard to the exhibitors themselves as a class. I find that the man who "didn't bring anything along" always had much better at home than anything he saw there. Such persons might as well have remained at home themselves with their light under a bushel, as they never will become the educators of the people. There is another class who only exhibit for the premiums that may be offered. They always make their entries in compliance with the rules, but keep back their products till near the time when the judges are expected to come around, so as to have it all look "nice and fresh." In the mean time they examine everything in competition, and if they think their neighbors have a better showing, do not take trouble to bring forward their exhibits at all. This, of course, can only apply to some living near by.

Then we have our seedsmen who are indispensable to the gardener, and a fair would be incomplete without them. They know how to arrange everything to the best advantage, so as to make an attractive display. All this of course is only an advertisement for "our seeds," but then they manage to show a full assortment of the very best vegetables that can be procured as the products from their seeds, and make up a full list of single entries and also for a general display, thus placing themselves in competition with the actual grower. I think a sweepstake premium would be about the correct thing for a display of this kind. How far this management was carried out at the last fair I do not know, but some complaint was made.

The worst specimen of humanity at our fairs is the habitual grumbler. He made an exhibit last year and, although he had the "very best there was" did not get any premium. "The whole thing was a farce and you would not catch him there again with anything to show"—"drinking, gambling and horse racing had become the main features of the fair, and it was about time for the farmers to stay away and let the whole thing fall through as it was bound to do."

In the vegetable department there were two hundred and forty-six single entries and only three displays from county agricultural, or horticultural societies, viz: Brown, Clay and Waseca, the rules laid down in the premium list having excluded the counties of Ramsey, Dakota, Washington and Hennepin, from competing. Why could not those Counties have been included in a district class and have given us a grand display?

Why there were no entries under the head of professional gardeners I do not understand. The premiums were liberal enough to have induced those living in the vicinity of Minneapolis and St. Paul to have made a good exhibit. I am inclined to think they did not covet the name of professor since some of our plain horticultural brethren went up into Dakota to attend a farmers' alliance and came back dubbed in that way.

What has become of the German Horticultural Society of Ramsey county? It usually has made a fine exhibit at our fairs, and some members are practically our best horticulturists. If gardening is to become a science, we must act as co-workers together in our horticultural organizations and at our fairs.

The management has struck the right cord in offering premiums to the boys, but I suppose the boys did not know of it in time to avail themselves of the privilege and prepare for the exhibition, hence, there were no entries in that department. I hope this arrangement will be continued in the future, not only for the benefit of the boys, but for the girls also, in all the different departments in which they are capable of competing. They would enjoy it as a real pleasure, and in the ardent effort to excel and show what they are capable of doing, would acquire much knowledge that would otherwise be neglected and lost, and which would be of great advantage to them in subsequent life.

We find the products of but thirty-two exhibitions on the board, and but seven counties in the State represented. The whole amount of premiums awarded on vegetables was \$324.00, of which twenty-four exhibitors received part. In quality the display

was creditable, but not as complete, and in some respects not equal to former years, the dry season affecting the growth, and insect enemies were more numerous than usual, particularly the cabbage worm and potato beetle. The crops however were generally good where thorough cultivation was attended.

The varieties approaching the usual standard of excellence, were squashes, melons, pumpkins, tomatoes, onions, beets, lettuce, rhubarb and pepper. Potatoes, rutabagas and turnips were rather inferior in growth and in quality, and cabbages were almost a failure, chiefly on account of the ravages of the cabbage worm.

The vegetable question is one of great importance to the community at large, and demands more than a passing notice from this Society. In order to bring the subject more fully before its members, I hereby append some leading questions which I think are not inappropriate for you to consider at this time. You represent almost the entire State, and can give some information in regard to your particular localities.

1. What has been the conditions of the season in your locality in regard to the vegetable crops?
2. Are vegetables grown for market to any extent in your section, and how do the profits compare with other crops? What markets have you?
3. What fertilizer do you use, and how applied?
4. Is a rotation of garden crops necessary if the ground is kept in a high state of cultivation?
5. What varieties of potatoes are best for summer and for winter use, also for market, profits considered?
6. What vegetables do you find subject to disease, and what is the nature of the disease, and do you know a remedy?
7. What vegetables are effected by insects, and to what extent, and the remedy?
8. What other information of value to the vegetable gardener are you able to give?

The following paper was then read by the Secretary :

RUSSIANS AT THE STATE FAIR.

By Chas. A. Keffer, Minneapolis.

Mr. A. G. Tuttle, of Baraboo, Wis., exhibited seventy-five varieties of Russian apples at the State Fair, probably the largest display of this fruit ever made in the United States by one grower. Mr. Tuttle was present, and by his uniform kind-

ness and courtesy in answering questions, added much to the value of his magnificent exhibit.

The committee noted, among the many showy apples in the list, the following sorts which they regarded as worthy especial mention.

The keeping qualities and condition of tree were given the committee by Mr. Tuttle. The haste with which this report was necessarily made, renders a complete description impossible.

The best keepers shown were Repka, July; Arabskoe, May; Omensk, March; Vargul, Antonovka, February; Blue Anis, January.

In quality they rank as follows: Vargul, Antonovka, Repka, Blue Anis, Omensk, Arabskoe. The samples were too immature to judge of flavor, but Vargul and Antonovka, which resemble each other, are much finer in texture and evidently much better than Duchess.

In size Omensk, Arabskoe, Vargul and Antonovka, are large apples, Blue Anis is medium, and Repka is small.

Arabskoe has blighted in twigs, but otherwise they are thus far free from blight, and all are as hardy as Duchess.

Among the early winter sorts, the committee were most pleased with Golden White,—season of Wealthy, Hiberna, December; Zuzoff's Winter, December; Red Queen, December; Long Arkad, November and December; Zuzoff, November and December.

In quality this list ranks Golden White, Long Arkad, Zuzoff, Zuzoff's Winter, Red Queen, Hiberna.

Golden White is an apple of fine flavor though rather coarse grained. Hiberna is sour and only good for cooking—for which purpose however it is excellent. In size Hiberna, Golden White and Red Queen are large, Zuzoff's Winter and Zuzoff are medium, and Long Arkad is small.

As to hardiness, Hiberna and Long Arkad are hardier than Duchess—the others as hardy as Duchess. None of this list is subject to blight.

The September and October List includes Raspberry, Switzer, Anisette and Arabian (both Duchess type) Titovka, three hundred and sixty-three, Green Selonka (September) and Zolatoreff; of sweet apples, Barloff and Beautiful Arkad. In quality this list stands, Raspberry, Switzer, Green Selonka, Titovka, Three Hundred and Sixty-three, Anisette, Zolatoreff and Arabian. Of the sweet apples the Barloff is the better.

Raspberry fulfills all the requirements of a fine dessert apple,

being beautiful — fine red color covered with bloom, fine white flesh of pleasant flavor — we should say almost "best." The Switzer, Green Selonka, Titovka and Three Hundred and Sixty-three are all good sorts, which anyone can eat with satisfaction, the Green Selonka and Titovka being large, highly colored varieties.

In size Titovka, Green Selonka, Zolatoreff, Beautiful Arkad, Anisette, Barloff and Arabian are large, Three Hundred and Sixty-three and Switzer are medium, Raspberry is small. All are as hardy as Duchess, Zolatoreff being hardier. Blight has infested Switzer, Barloff, Green Selonka, Zolatoreff, and to a greater degree, Titovka.

The summer list in the order of earliness includes among others, Early Champagne, Sour Turnip, Yellow Transparent, Lowland Raspberry. In quality these rank, Lowland Raspberry, Yellow Transparent, Early Champaign, Sour Turnip. In size Yellow Transparent is large, Lowland Raspberry medium, Early Champaign and Sour Turnip are small. All of these are as hardy as Duchess, and only Yellow Transparent blights.

It must be remembered that the items of blight and hardiness are given as observed by Mr. Tuttle at his home in central Wisconsin. Due allowance should be made for the fact that the further west and north trees are taken, the more intense is the cold and blight conditions.

[We append, in this connection, the following from the *Farm, Stock and Home*.—SECRETARY.]

"An examination of the Russians, exhibited by the well known, industrious and patient horticulturist, A. G. Tuttle, almost, if not quite, forced the conviction that the eagerly sought for and long delayed solution of the problem of apple growing in the Northwest had at last been triumphantly solved. Mr. Tuttle had seventy-five varieties on exhibition, embracing many desirable sorts, from those maturing in early fall to those which appear to be able to keep till apples come again. Many of these were "first fruits," and their quality, keeping and other desirable points are yet to be demonstrated; others again have been fruited before and their value is well known. Taken all in all, this show of apples justifies Mr. Tuttle in the evident pride and satisfaction he feels in it, and warrants the people of the Northwest in congratulating themselves on the assurance that but a few years more will pass before the Northwestern apple will take its place among the other products which have made

this region famous, and by its excellence will add one more triumph to the many which have already been achieved here in the realm of agriculture."

DISCUSSION.

Mr. O. F. Brand, who was a member of the committee with Mr. Keffer, was called upon to report as to these Russian varieties, and said:

In conversation Mr. Tuttle admitted that blight was the greatest enemy of the Russian varieties. We could not tell from the looks of the fruit how much they blighted, but from my own experience I find that those varieties that don't kill by blight don't bear very much.

Mr. Smith. You had a great many Russian varieties eight or ten years ago; what has been your experience with those?

Mr. Brand. I had sixty-five varieties of the first that were sent out by the department, which I propagated, and I got most of them large enough to bear. Where the Wealthy bore from trees planted in the same year, a bushel and a half to the tree in 1881 and 1882, there is not a tree of the Russian varieties that have borne a half a bushel. There are several varieties of trees that remained, which were root grafts in 1874, and some of them were grafted two or three years previous to that. Of those that remain there are only two varieties that are good for anything, and they never bear but very little. So I class the Russians like this: Most of them blight; those that remain which bear, three-quarters of them are good for nothing, and the rest don't bear enough to be good for any purpose except to make up a collection at a fair.

Mr. Corlett. Do your trees stand in sod or are they cultivated?

Mr. Brand. They were cultivated for a good many years.

President Elliot. I would like to know your method of planting, whether shallow or deep?

Mr. Brand. I plant deep; on heavy timber soil, a black sugar maple soil, underdrained with clay. There is a descent to the southwest.

Mr. Pearce. It seems to me Mr. Brand has put Russians in a bad light, and it don't coincide with my observation; neither does it with that of a number of other members present who have orchards in this section of the country. I refer to Andrew Peterson's orchard; he has trees twelve years old and

has twenty-five or thirty Russian varieties; his trees have borne well and some of the fruit is of fair quality. I have watched his trees with much interest and have never found trees that were more healthy or prolific; the fruit is large. There is the Yellow Transparent that I have known a number of years which bears freely and fruit of good quality.

Mr. Corlett. Mr. President, in the spring of 1880, I procured forty-three varieties of Russians from Prof. Budd; I divided the collection with five neighbors, living in Clayton County, by his request, so as to test them on different kinds of soil. Some had timber, oak openings, some hazel-brush land, some rather broken and near sink holes, and three of the parties had rich prairie soil. My own is what is called high prairie, and is near the Milwaukee road, a short distance west of McGregor. I can only speak from memory as I did not bring my list of varieties; but of the kinds set in 1880 of those that bore last year were Nos. 544, and 210, No. 61, known as Red Streaked, Nos. 19, 437, 262; of this number 19, 262 and 61, this past season the limbs had to be propped, as they bore such an immense crop. No. 544 seems to be a shy bearer; it has borne for three years. It is an early winter apple and we have kept the fruit till January 22d. Of the forty-three varieties I planted myself Nos. 185, 262 and 252 blighted; Nos. 19 and 230 are the only ones in the collection that blight now. Nos. 288, 316, 337, 15 (Moscow), 230 and 387 are the finest trees I ever saw.

Previous to the time of applying for the Russians I had about one hundred varieties in my orchard. I have grown successfully in times past such varieties as Dominic, Early Harvest, Sops of Wine, Winter Winesap, Ben Davis, Benonia, Seckler's Red and have none of those kinds left now, and my only hope is in the Russians. When I heard these letters of Mr. Tuttle and Prof. Budd read I began to think I was on the right track, but on hearing this report from Mr. Brand I don't know what to say about it.

From where I live I can see into seven townships; the ridge inclines a little to the west, somewhat steep to the north, and not so much to the south. North of me one of these varieties has borne two years, and it is thought a great deal of; I don't know the number of the variety. There are some eight or ten of these that have borne, and some of them are evidently winter apples. I set my first orchard in 1856, and as that failed I have concluded our only salvation was in the

Russians. If they are hardy we can top-work them, if the quality of the fruit is not satisfactory. I have three hardy varieties of winter varieties which I have grown in that way. I budded trees on the last day of May and they failed; my next budding was on the ninth of June. I kept on at different times till the twenty-fourth of August, and have a thousand buds living in the different kinds of stock, budded on the Russians. Have top-worked Duchess and other Russian varieties in what is reported as long-keeping winter apples. The first three years I sowed the orchard to buckwheat; the last three in clover. My location is about thirty-five miles south of the Minnesota state line. Our hope there is in the Russians, and if that fails I am going to sell out and go to Tennessee or somewhere else.

Mr. Gideon. I got a great many of the Russian varieties, of cions, and set out the trees some years ago. The blight destroyed all but three of the trees in the orchard, and the fruit of those proved to be worthless. Afterward I had some 230 varieties. But the blight destroyed most of them. Four years ago I had some 7,000 orchard trees; over 2,000 went down entirely, and others were damaged. I still had 20 Russian varieties left, but two years ago took most of those; only 2 of the list bore last season. Our soil is a rich, warm loam, and brings forward trees quickly, and they are generally in bloom some two weeks earlier than trees a mile away, on clay soil.

The injury to fruit trees two years ago was caused by the early freeze. Before cold weather set in I was in my orchard and noticed when I broke the twigs that the bark would peel as well as in June; it froze hard that night and that used up my Russians. The stock I had was about the same as Duchess and Wealthy in hardiness; but none of them were able to stand two years ago when they were caught in a full flow of sap. My doctrine is that it takes a tree with the Siberian crab in it to stand the influence of the sap flow and bear the next year.

Mr. Dartt. I wish to inquire of Mr. Corlett if his Ben. Davis were not as hardy as the Russian varieties at the same age?

Mr. Corlett. When the cold wave struck the Ben. Davis and cleaned them out the trees were about twelve years old and had borne three crops; the Russians I have now were set in the spring of 1880.

Mr. Smith. Mr. Brand, didn't you have some Haas that stood well till they were about twelve years old?

Mr. Brand. Yes, I had Haas and Saxton, Talmon Sweet, Fameuse, the Willow Twig, and a good many more. My experience is that trees stand very well and after beginning to bear at the age of eight to twelve years are killed out, and the Russians likewise. They may do well for awhile but after they begin to bear and the vitality is reduced they are unable to stand the winters as well as when four or five years old.

Mr. Corlett. We had all the leading varieties mentioned and in the last three years we have grubbed up a thousand trees; some of our Haas trees were nearly a foot in diameter.

Mr. Dartt. It occurs to me we lose time when we place much dependence upon the hardiness of a tree here because it is hardy in a favorable locality in Wisconsin or in Iowa. This location described by Mr. Corlett is probably a favorable one. It is near the Mississippi Valley, it is a hill country. The fact that the Russians have done well four or five years is not evidence to my mind that they are hardy, because we know that the Ben. Davis, for instance, did well in that section for several years, which is known to be a tender variety. Thirty years ago when in Wisconsin I raised apples, and I know something about their seedlings. Mr. Tuttle's location is similar to the one I had there. I could raise most any of the standard apples, but when I hear it said that we can grow those seedlings here in exposed situations I think it is but a waste of time. I brought some of the hardiest seedlings I could find to Owatonna, but they are all gone; all there is left is the Duchess.

Mr. Corlett. We had Utter's Red, Northwestern Greening, McMahon White, Wolf River; they are all dead.

Mr. Brand. I wish to add that I have eight or ten Duchess that have been planted twenty years this spring, which look good for as many years more.

Mr. Dartt. When I said all were gone but the Duchess it was a little too sweeping, for I have the Lieby, that looks well and has borne some apples. What I wanted to say was that I had nothing on which I placed dependence outside the Duchess.

Mr. Harris then presented the following report as delegate to the meeting of the Dakota Horticultural Society:

REPORT OF DELEGATES TO THE MEETING OF THE
DAKOTA HORTICULTURAL SOCIETY, HELD AT
SIOUX FALLS, DEC. 14, 15 AND 16, 1886.

Mr. President, and members of the Minnesota State Horticultural Society:

By request of your president and secretary we availed ourselves of the opportunity offered for attending the third annual meeting of the Dakota Horticultural and Forestry Society, which took place at Sioux Falls, Dec. 14, 15, and 16, 1886.

Sioux Falls is a city of about 8,000 inhabitants, is pleasantly situated, and located in the centre of a large area of the finest agricultural lands in the Northwest. The location possesses many advantages that would naturally tend to make it a large and flourishing town—the metropolis of the region. The Sioux River has here a fall of about ninety feet, affording one of the finest water powers in the world. It is being improved to some extent; is running one of the finest flouring mills upon the continent, with a capacity for making 1,200 barrels of flour per day; two or more mills for sawing, turning and dressing stone, etc.; and has power, not yet utilized, to turn the machinery to do all the manufacturing of the entire country tributary to the city. The valley of the river is a vast field of granite, of a superior quality for street paving, building purposes, the manufacture of monuments, fine building, etc.; the granite is nearly indestructible, takes on a polish smooth as glass, and presents beautiful markings. The quarries afford employment for a great number of laborers, and the supply is inexhaustible.

The state prison and a university are located here, the hotels and business houses are first-class, and the town has an air of solidity and permanency about it, as well as the push which is characteristic of the new towns of the West.

The meeting convened in the pleasant rooms of the Y. M. C. A., at 2 P. M. on the fourteenth, and was promptly called to order by the president E. De Bell, of Sioux Falls. The number of members present at the opening was not large, but continued to increase during later sessions. From beginning to end the meeting was deeply interesting, and much valuable and practical information was elicited. The order of business and manner of conducting the meeting did not differ materially from that followed in other societies we have met with. In addition to

the Dakota members, there were present two delegates from the Iowa society and three from the Minnesota.

A timely and appropriate address of welcome was made by R. J. Wells, of Sioux Falls. He said that he fully realized that Dakota was a land possessing a deep rich soil, ready for the husbandman's plow, well adapted to the production of cereals and vegetables, but it also abounded with broad, level, wind-swept prairies, affording a boundless field for the horticulturist's art. What the future would be was yet unknown. All eyes are turned towards this meeting, and a silent prayer went up from every heart that success might follow their deliberations. The future comfort and happiness of the people of Dakota depended very much upon the success or failure of this meeting; upon the work started now and carried on through coming years. They were known to be earnest, observing and practical. It was the mission of horticulture to plant forests and groves, windbreaks and hedges, orchards and gardens, without which Dakota homes would be desolate indeed. He therefore extended to them and their friends from neighboring states, who had come up to join in their deliberations, a cordial welcome.

Continuing, he said: "The pathway of humanity since the dawn of creation has been one of destruction. Your meeting to-day is not for destruction but for creation. In olden times man was placed in a garden planted by the hand of God; a garden of most beautiful trees and refreshing fruits. For a misdemeanor he was banished from this delightful garden, and with a perverted nature his descendants have gone forth and with a lavish hand have almost denuded the fairest lands of trees and nearly annihilated from the earth many races of the noblest animals. You, gentlemen, have come to a land where there is nothing to destroy God's great pasture kept for ages for the bison, elk and deer. The savage, who subsisted by the chase, has retired before civilized man and the murderous hunter has depleted the numbers of the animals next to extermination, and you are called upon to transform these great pastures into a condition that shall fit them for the abode for progressive civilized man. Your work is to create and subdue; to create forests, plant orchards and gardens, and subdue the soil that it be in a fit condition to produce bread for millions of the inhabitants of other lands and make life tolerable for us while doing it. You are to develop and improve the native products of the soil; to introduce and acclimatize the choicest fruit and

plant gems of other soils, to manipulate, test and improve them and then to give them to the people. Failures at first may be the rule, success the exception, but nature will open up her mine of treasures to those who carry the key to unlock them, and as a reward a grateful people will crown you public benefactors, whoever of you develops any fruit until it will succeed and then introduces it for the use of his neighbor. The man who gave us the Early Rose potato did more for this country than he who discovered the gold of California. The man who develops a hardy, good apple that shall succeed everywhere in the Northwest and fill the season from the last Duchess to the first Strawberry, will do more for humanity than the greatest philanthropist who has ever lived, and earn a fame that will endure long after granite monuments have crumbled into dust."

C. L. Smith, of Minnesota, responded to the address of welcome. A considerable portion of this session was used by the Minnesota delegates in speaking words of encouragement, reporting the workings of their society, explaining the objects, methods, workings and probable results of the state and individual horticultural experiment stations. This was followed by the reading and discussion of a novel and very interesting paper by A. W. Sias, of Rochester, Minn., entitled "Horticultural Nuts to Crack." This paper called out a rambling discussion on fruit, nursery trees, acclimatizing by taking seeds from the most northern limits for the ideal fruit without seeds for our descendants, who may in the course of time be toothless, the use of thorns, etc. The discussion finally drifted toward forestry.

At the evening session the delegates from Minnesota were unanimously elected honorary life members of the society. This, of course, called for a vote of thanks from the Minnesotians, and an acknowledgment of the honor shown to our Society. Following this the president read his annual address, an able document, in which he alluded to fruit culture as having become a great and leading industry in all other parts of the country, and so important as to demand our first attention. But there is no other subject that comes before the people of this Territory where they are more at sea than in the growing of fruits. He spoke at length upon the adaptation of varieties, and said it might require a vast amount of experiment, and years of time before a sufficient number of varieties were found that were adapted to every part of the vast country, and that every man could plant with a certainty of succeeding with them. The subjects of experimental

fruit and forestry stations, to be supported and sustained by the government, were well handled, and he demonstrated that at least two such were immediately needed. In timber culture satisfactory results had not generally been realized. He thought trees were endowed with a certain amount of inorganic sense, and that the failures were oftener the result of not consulting that sense and complying with the conditions required, than from any inherent fault of the tree, or the climate where it was transplanted. There are about two million dollars worth of fruit wanted annually, to put with the meat, grain and vegetables grown here, to afford the present population a wholesome diet, that will promote and sustain strength of body and vigor of mind, and establish a love of home among the rising generation, that will keep them good and loyal citizens. At least one-half of that amount can be supplied by fresh, canned and dried small fruits that may be grown here with certainty when the people are educated up to follow the proper methods of planting and cultivation. And were it an established fact that apples could never be made to succeed here, it would still prove the part of wisdom for our government to provide liberally for the encouragement and promotion of horticulture.

After the president's address the subject of growing evergreens upon the prairies was taken up and discussed until a late hour.

The second day's session was opened with the reading of a paper prepared by D. S. Grimes, of Colorado, on the Rocky Mountain evergreens, and their adaptation for planting in Dakota. Mr. Grimes evidently understood his subject thoroughly and he discussed the methods of planting and cultivating that class of trees, and gave many important suggestions that were listened to with great interest.

Other papers on forestry were read which attracted much attention from those present. H. R. Hunter, of Sioux Falls, followed with a paper on Planting and Rearing Evergreens. This paper carried much weight with it owing to his having made the growing of evergreens a study for several years, and now having an evergreen farm near the city. These papers led to a renewal of the discussion and many important points and experiences were brought out. It is unfortunate that there was no stenographer present to take them down. Mr. Hunter has growing upon his farm about twenty acres of evergreens in solid blocks and nursery rows. At the noon recess a committee of which your Minnesota delegation formed a part, went out to his

farm to examine the trees. A visit to the farm is all that is needed to enable anyone to recognize his ability to grow the trees, and their adaptability for cultivation in Southern Dakota. We found here blocks of trees of various ages, with scarcely an inferior or missing tree and ranging from one to four or five feet high. The varieties were Austrian, Scotch and White Pine; Blue, White and Norway Spruce; Balsam Fir, Red Cedar and American Arbor Vitæ or White Cedar in large quantities, and some others in less numbers. If the people within a radius of a day's travel would procure their trees from him instead of ordering them from some foreign tree agent, and select a favorable time to secure and plant them and afterwards take care of them, there is no good reason why ninety-nine out of every hundred should not live and do well. This farm is also well protected and sheltered with windbreaks of deciduous trees.

In the afternoon and evening sessions other papers and addresses were given upon different classes of fruit culture, and the facts and experiences brought out in the course of the following discussions tended to strengthen the belief that strawberries, currants, several varieties of raspberries, blackberries and grapes, where given winter protection and summer mulching, could be successfully grown.

The list of evergreens recommended for planting for forests upon the prairies were Scotch Pine, White Pine, White Spruce, Red Cedar, Arbor Vitæ. The most ornamental for trial, Colorado Blue Spruce, Dwarf Rocky Mountain Pine, Douglass Spruce; deciduous trees for groves and timber, White or Green Ash, Box Elder, White Willow, Cottonwood, European Larch, Elm, Wild Black Cherry, White Birch and Sugar Maple. For windbreaks, White Willow. For fruits, strawberries, Crescent Seedling, fertilized with Downer's Prolific, Chas. Downing, or Glendale; grapes, Concord, Moore's Early, Worden, Delaware; apples, Duchess and Wealthy, for orchards; Tetofsky for garden, Siberian and Hybrids, Virginia and Whitney No. 20. For trial, Gideon's Florence. From the best information that could be gleaned it was thought best to recommend the following Russian varieties for trial in limited quantities, when they could be procured from reliable parties, viz.: Hibernial, Ostroloff's Glass, Antonovka, Red or Yellow Anis, Green Streaked, Longfield's White Pigeon and Charlamoff. Only the best varieties of the native wild plums were recommended.

All lists for adoption were brought forward by committees

appointed for that purpose and the reports were considered and varieties adopted or rejected item by item. The election of officers resulted in the re-election of those of last year, therefore E. De Bell, of Sioux Falls, is president and Mrs. Laura A. Alderman, of Hurley, secretary. The next annual meeting is to be held at Huron.

Altogether this was a pleasant and profitable meeting. Our thanks are due to the officers and members for many kindnesses and courtesies shown us in their efforts to make our stay with them pleasant.

JOHN S. HARRIS, }
M. PEAROE, } *Delegates.*
C. L. SMITH, }

Mr. H. R. Hunter, of Sioux Falls, was here introduced, and on motion of Mr. Harris, made an honorary member of the Society for five years.

Mr. Hunter returned his acknowledgments to the Society, in a few brief remarks.

Mr. J. E. Corlett, of Iowa, was also made an honorary member for five years.

DISCUSSION.

Mr. Allen. If remarks are in order upon the report on the vegetable exhibit at the state fair, I would like to say a few words. It seems to me we have been educated up to think that the largest specimens should take the premiums, and there ought to be a change in that regard. It is the "Jumbo" that gets the premium; the big squash, pumpkin or turnip. I think we should look more to the quality than to the size, and have judges that understand their business. The way fairs are run, exhibitors are often dissatisfied and cry it down as a miserable horse race, and say they will attend no more. The judges are often to blame for this. At Red Wing we had a fair last season, with a good display and pains was taken to select good judges. The premiums were awarded on the merits of the various articles, and parties were informed that quality and not size was considered as the test of superiority.

Mr. Harris. It is through criticism of methods that we are enabled to remedy evils, and I am glad the gentleman has spoken. It is very important that the quality of the article

exhibited should be considered. The big Duchess is apt to take the premium, no matter how coarse and poor the quality of the fruit. The same rule applies with grapes. You can nearly double the size by pruning and forcing the growth, but it is done at the expense of quality. As the State becomes older, there will be improvement in the matters referred to.

Mr. Dartt. Mr. President, evidently good judges will be the best everywhere. If we could have skilled men for judges of stock, as well as in every other department, it would be well; but that is an impossibility; we can't get them. I don't see any better way than to keep on as we are doing and get the best committees we can, and let them use their best judgment. At the last state fair, the directors did the best they could, under the circumstances.

Mr. Smith. The suggestion to have premiums based on the quality of the article exhibited is a good one, but it may not be practicable without the committee giving the reasons why they make certain awards. This was illustrated in the award of premiums on butter, where there were a hundred entries at the fair. The explanations made were satisfactory, and those who did not receive the premiums acknowledged they were not entitled to them.

QUESTION BOX.

The question box being called for, the following was read: "Why is the most sheltered spot the worst place to be found for the growth of apple trees?"

Mr. Pearce. For the reason no wind comes there.

Mr. Smith. It causes late growth in the fall, which causes sap blight.

Mr. Dartt. Mr. Chairman, I think it is because it is the hottest place and the coldest place to be found; the cold air settles in there, and the warm air can not get out. If there is a slight current the warm air always rises, leaving the cold air so that the mercury will run several degrees lower in a sheltered spot than where the wind has full sweep, on higher land.

Mr. Allen. Mr. President, that is entirely different from the idea I had. Where I have succeeded with fruit was in a coulie protected from the north and east winds. My other trees in the valley that were exposed have principally died out. I have Wealthy, Duchess, Strawberry and some seedlings that have been bearing well in this little coulie. The ravine runs south.

Mr. Smith. But the trees are on the west side of the coulee and part way up the side hill?

Mr. Allen. Yes, and they are protected.

Mr. Dartt. The prevailing wind is from the south or the west and not being sheltered from those is not in the most sheltered spot.

Mr. Allen. No wind can touch them without coming over the bluff and coming down.

Mr. Dartt. The cold air would settle in the lowest ground.

Mr. Latham. The location described by Mr. Allen is undoubtedly one of the best for raising fruit of any kind in this climate. The very lowest ground is unsuitable, no matter whether it is for the growth of the strawberry which lies under the snow or for the grape vine, under a slight covering of earth, or for the life of the apple tree. The summit of a hill is equally bad; but the side hill, part way up, protected from severe winds and where there is the least liability to change in temperature, that is the best place, and the safest and surest for raising fruit. Such a place as the one described by Mr. Allen would undoubtedly be a good one to plant any kind of fruit upon.

Mr. Harris. I visited the grounds of Mr. Wilcox, near La Crosse, on the east side of the river, which are protected by a narrow ravine; the hillsides are quite steep. In the lowest part of the valley he cannot raise apples, but he is raising some of the finest trees of the old varieties I have seen in my travels the past year, and they are pretty well sheltered by the bluff. I found Fameuse trees without any outward blemish upon them, while elsewhere they have been mostly killed. The bluff rises some 150 feet and the sun and wind cannot touch them and they stand better than any place I ever saw.

Mr. Smith. Wouldn't there be naturally a draft of air from the lower Mississippi valley along the sides of that bluff?

Mr. Harris. No doubt of that, but the trees are sheltered, and have the best kind of shelter.

Mr. Pearce. I have studied the apple tree business as well as I could. I have seen trees raised under different circumstances and on different elevations. Out in Pipestone county, one of the highest elevations in the State, on that ridge, the highest in Southern Minnesota, they were raising the finest apples.

Mr. Harris. Murray county is the highest land in the State.

Prof. Maginnis. The bluffs rise some six hundred feet above the Mississippi; Barn bluff at Winona I think is just that.

Mr. Pearce. I found the Duchess, Whitney and many other varieties that appeared to be in perfect condition.

Mr. Brand. I suppose they were six or seven years old.

Mr. Smith. Some were eight years old.

Mr. Pearce. I have observed the same thing at Montevideo, in the Western part of the State, and have been astonished to find the Haas standing well. My experience is that the higher the elevation the better the trees stand. I claim it is not the cold weather that kills our trees and could prove it if I had time. It is the peculiar condition of the sap in the fall. I have known trees to blossom in the fall and that was the condition year before last. I said then the trees were dead and there would be a sharp and woeful howl in the spring; the trees were killed in December. It is not the cold weather that caused the loss but the peculiar condition of the sap. The same thing occurred in Ohio, Illinois, Missouri and throughout the Northwest. If I was going to set an orchard I would select the highest elevation.

Prof. Maginnis. In confirmation of what Mr. Pearce has said in favor of high elevations I would say that there is an orchard near Sparta, in the Trempeleau valley, on limestone soil where there are trees that have been in bearing for years, of varieties that have not been grown in any other part of Wisconsin, except along the lake shore. I received this information while attending the farmers' institutes, and the reasons assigned were substantially those given by Mr. Pearce.

Mr. Harris. I have seen the trees on the place spoken of and know they are raising trees that I cannot touch.

Mr. Dartt. Mr. President, the fact that those trees are growing on that high ground indicates that it was a favorable locality; still they may get to bearing, size and then die. There may be low lands in the vicinity, which might be a decided advantage. An elevated plateau, or high level land, is rather against the success of trees, depending on the elevation. If the highest land was the best location for trees you might keep on till you reach the line of snow on the mountains; elevation is good if you don't elevate too much.

Now, the gentleman says that it is not cold that kills; perhaps I would be the proper one to dispute it. [Laughter.] If it was not the cold it seems to me they would not be found dead after we have had an extremely hard winter. You notice that two or three years ago trees down as far as St. Louis were killed out seriously and they reported a cold wave down there when the

mercury was down nearly to forty degrees. It is said by our friend that it was the peculiar condition of the sap in the trees in the fall. I have no doubt but the extreme cold, day after day, freezes our trees dry and when spring opens there isn't life enough left in them to get up a good circulation on the outside. The hardiest varieties start and struggle along and if the next winter is favorable they recover, leaving a black ring in the middle of the tree, making them black-hearted.

Mr. Pearce. How was it some ten or twelve years ago when we had so many trees killed, was it the cold weather that killed them?

Mr. Smith. No. I want to say I have been through three of these winter-killing periods; 1866-7, 1872-3 and 1884-5. To a certain extent brother Dartt is right. But when he says the cold does all the mischief, I would call attention to the fact that each one of these disastrous winters has been preceded by a late fall and continued growth late in the season, so that trees were killed before the very cold weather set in. Again, we have had extreme and continued cold without results. Forty degrees below don't kill an apple tree if in proper condition.

Mr. Latham. Mr. Chairman, I think there is a fact about this that we ought to recognize as individuals and as a society. I have been a member a good many years. We have been through these cold spells, and I have noticed after every one a disposition on the part of members of the society to ascribe the loss of our fruit trees to something besides cold weather; there is always good cause for it. The winter of 1873 was one of these hard spells and at our next annual meeting there was a long discussion, and I remember that some of the members from the southern part of the State thought it was because the ground was so very dry down there; but in this section of the State it was because the ground was so wet. [Laughter.] I was a young member at the time, but I was amused to hear the discussion and all so persistently ignoring the fact that it had been so very cold. If we had no cold weather here we could raise peaches and bananas. The trouble with raising apples and pears in this country is our winters are too cold, and we might as well face that fact. Our trees are not hardy enough for the climate. I can stand the climate with proper clothing, but to wear mosquito netting might cause me to freeze to death; it doesn't follow that I couldn't live elsewhere. We must look for something that will stand the winter, and we might as well face the real situation.

Mr. Dartt. They say it is not the fall that hurts. It is the sudden stop. [Laughter.] That is about the position taken here. They reason that it is not the hanging that killed a man, but the breaking of the neck, or the stopping of the breath. I think if our trees could escape this extreme cold they would probably be all right.

Mr. Pearce. One word: I dug trees the fall before that winter of 1873 and buried them, in the spring they were all dead. The ground scarcely froze at all during that winter, for potatoes came up in the spring that had been in the ground over winter. This is a matter of history.

Mr. Smith. I put 3,000 trees in the cellar the sixth of December and they were all dead in the spring.

Mr. Harris. It was root-killing that caused the injury to trees that winter. Northern Spy showed no injury from the winter, but the trees were killed at the root. I know in our ocality we attributed the difficulty to the long-continued and severe drouth.

On motion the meeting adjourned till 7 o'clock.

EVENING SESSION.

TUESDAY, Jan. 18, 1887.

The meeting was called to order by President Elliot.

The following committee was named on Revision of Fruit Lists: A. W. Sias, M. Pearce, E. H. S. Dartt.

Mr. Smith. There is one thing I would like to speak of, to throw out a suggestion to members of the Society at this time. I noticed an article in the *Iowa Homestead*, in the editorial columns, on the subject of protecting farm buildings with windbreaks, recommending evergreens, and, as a temporary expedient, the growing of the Russian Mulberry, to be followed with Scotch Pine, the walnut and other valuable timber. I want to protest against this, for I must say I am not pleased with the Russian Mulberry. I have been well over the State the past year, investigated the timber-culture question, especially as regards the question of shelter belts, and I believe the most valuable for that purpose is the common White Willow. It can be grown on the prairie the best of anything I have found. It is unjust that farmers should be advised to plant out Catalpas

and Russian Mulberries, and trees of that class, which they must pay out their money for without getting any particular benefit, when they can secure the desired shelter belts with little expense by growing the White Willow.

Mr. Sias. I would suppose that a man who would recommend the Russian Mulberry would naturally recommend Scotch Pine next; it is about the poorest thing we have in the line of evergreens for a windbreak. I didn't know that till the twenty-first of August, 1883, when a tornado went through our city, leaving most of the trees of that kind at an angle of forty-five degrees, while Norway Spruce and most of the native trees stood upright. It has not proper leaf surface like White Pine, which has a five-leaf cluster. The leaves of a tree have an effect on the root. What is wanted for a windbreak is a tree that will stand firm like the White Pine. We have a native evergreen that I think much of, known as the Gray Pine. Some may be familiar with it, known as *Pinus Banksiana*.

Prof. Maginnis. Since you have given its botanical name I remember it, and have observed on the map where it grows, and I think there was only one variety that grew further north. I is found on Great Slave Lake, many degrees north of here; it is a cold climate tree.

Mr. Smith. The Jack Pine has a short leaf and is very tough, hard wood.

Mr. Sias. The foliage of the Gray Pine resembles that of Scotch Pine somewhat, but it is a hardier, tougher tree, with better root. It resembles the pine mentioned, but is not the same.

Mr. Pearce was requested to present his paper at this time on grape culture.

GRAPE CULTURE.

By M. Pearce, Minneapolis.

There is no fruit that possesses so many good qualities as the grape, fresh from the vine. It is found in every inhabited part of the earth, where trees or plants will grow, either in a wild or cultivated state. To our native varieties we are indebted for the best varieties we have, such as the Concord, Delaware, Worden, Moore's Early, and others. The handling of the grape vine, necessary to the highest success, is practiced by but few in proportion to the many thousands who are attempting to grow this grand fruit. It is safe to say that in the Northwest not over ten

per cent of those who attempt the culture meet with success. This large percentage of failure does not arise from unfavorable condition of soil or climate, but from ignorance of proper methods of planting, handling, etc.

In trimming the vines in the fall, for fruiting the next year, nothing should be left on them but fruit buds, and these in such quantities only as the age and vigor of the root will bear. Heat and sunlight are the great essentials to ripen grapes; hence the warmest and sunniest place should be selected for them. They will do well on any dry soil, though a sandy loam is best in this region. Side hills sloping to the south, or east, are the most sought after. In cold countries the vines should be protected from the cold winds of the west or north; soil should be moderately rich and cultivated deeply. Make the rows seven



FIG. 1.

feet apart and the plants eight feet apart in the rows, setting the roots eight inches deep, spread the roots in all directions, and press the soil firmly about them; allow but one cane to grow, and tie it to a stake about four feet high; keep off all sprouts from the roots. When the new wood has made a growth of three feet pinch the top; pinch back the laterals to two leaves; hold the plant at three feet and the lateral at two leaves, the first year, by occasionally pinching back; this will develop the buds, make the plant stocky and increase the size and vigor of the roots. Such a plant is shown at Fig. 1. About the middle of October cut it back to three buds, and just before winter sets in press it flat on the ground and cover about five inches deep with earth, with a few inches of straw for mulching. In the spring uncover, tie to the stake, and when the buds push, select the strongest and rub the others off. Manage the growing vine precisely as during the first year, with this exception; let it attain four or five feet, according to the vigor of the vine, before the top is pinched; that is for one vine, all the laterals must be confined to two leaves, and all sprouts that may come from the roots must be promptly removed. Such a vine, if vigorous and healthy, will be well supplied with fruit buds for fruiting the next year. In the fall remove all of the vine except that part which contains fruit buds.

The grapevine has three distinct kinds of buds: fruit buds, forcing buds, and wood buds. The fruit bud is large, round, or

nearly so, at the base; top, oval or round. The forcing bud is flat, or medium size, with a slightly peaked or pointed top. The wood bud is small, flat at the base and pointed. Fruit buds,



FIG. 2.

when they start in the spring, will blossom at each joint from the first to the fourth or fifth. A forcing bud will never blossom unless it is forced to do so by pinching the top of the vine when fifteen or twenty inches long. A wood bud can never be forced into fruiting, to any advantage. There is from two to three weeks difference in the time of ripening the grapes from the two buds first mentioned. Fully nine-tenths of the grape growers of this country are using forcing buds for fruiting, and that is the reason so many grapes never ripen. It is of the utmost importance that grape growers should be familiar with grape buds, for on this everything depends. Whatever system of trimming you may practice, remove all buds except the fruiting ones, and in no case should these exceed twelve to any root. The number of fruit buds must be regulated by the age and vigor of the vine; young vines are often ruined by overbearing. Fig. 2 represents Fig. 1 when two years old, laid down ready to be covered for winter protection. Fig. 3 represents the same vine, the next fall, loaded with fruit.

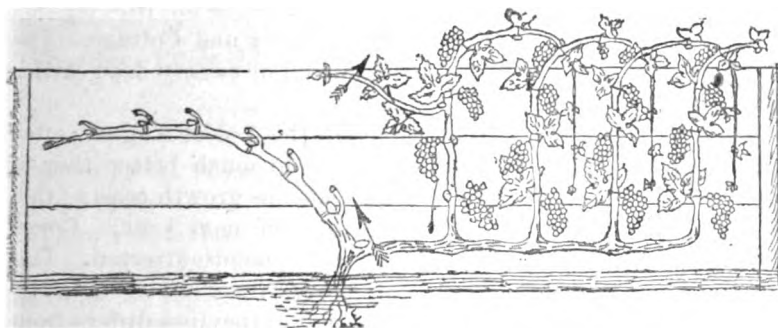


FIG. 3.—TRAINING VINE TO TRELLIS.

The trellis is of three No. 12 white wires, on posts three and a half feet high, the bottom wire twelve inches from the ground, the second midway between the foot and the top. The horizontal vine in Fig. 3 is Fig. 2 in its subsequent position on the

trellis, fastened to the lower wire, in the spring. The buds should all swell at the same time; this result is accomplished by elevating or lowering the vine at the top end; if the buds are making too much growth at the end of the vine, drop it down a little; if it is too slow elevate it; by so doing all the buds can be made to start together; this must be carefully attended to at the commencement of growth. When growth commences it will be very rapid, blossoms and clusters will appear at each joint as shown in the cut; tie the growing canes to the wires; when they reach the top wire turn them down between the fruiting canes as shown in Fig. 3. Allow nothing to grow but the fruiting canes and two leaves to each lateral. The long vine on the left is for the next year's fruiting; allow it to make a growth of six or seven feet, then pinch off and hold all the laterals to two leaves. In the fall remove the bearing arm at the point indicated by the lower dart. The new vine will be the next year's fruiting arm; this is known as the "renewal system," each year growing a fruiting arm or vine.

If you are growing from forcing buds, which is too often the case, pinch the top of each cane above the third joint; also the laterals beyond two leaves; keep off all sprouts that may appear; renew the pinching as new growth appears, and in no case allow the vines to go beyond the top wire. The grapes will be later in ripening, at least two weeks or more, than those from fruit buds.

The following are the most popular varieties for this region: Concord, Delaware, Worden, Moore's Early and Cottage. The last two named are large and good, fifteen or twenty days earlier than the Concord.

Grapes should be well cultivated till the first of August; after that pull out the weeds and they will do much better than if cultivated late. Trim in the fall as soon as growth ceases; this will hasten the ripening of the grapes the next year. Cover the vines as late in the fall as possible, as before directed. Uncover as soon as danger of freezing is over.

I am aware that my mode of handling grapevines differs from most growers in this region, but it is not new, has been fully tested by myself and other parties, and has been found to be far ahead of any other system. The principal advantages of this system are: early ripening, larger quantity and less labor.

DISCUSSION.

Mr. Harris. I would like to ask how many years you have been practicing your system of pruning?

Mr. Pearce. All my life; it is the old system and it has always been followed.

Mr. Brand. Would you advise propagating vines from cuttings treated in the manner you describe?

Mr. Pearce. I would say that you can take cuttings if you wish and grow them so that they will produce a crop of grapes in three years. You can grow fruit the next year even if desired.

President Elliot. That is not generally considered good policy.

Mr. Pearce. I would cut the vine so as to leave three eyes and no more. You can take some fifty of these and tie them together after taking them off in the fall. Make an excavation, putting the top ends down, covering with three inches of earth, then covering with two or three loads of manure; this will create an artificial heat. In the spring the buds will be calloused. Set in strong ground and if they are fruit buds they will grow. It is not policy if you are growing vines.

Mr. Harris. Care must be used not to put on too much manure or the vines will rot, and I think six inches of earth better than three for a covering. The object of the manure is to keep the frost out.

Mr. Pearce. We tried the process described, a year ago and were very successful.

President Elliot then read his annual address.

PRESIDENT'S ANNUAL ADDRESS.

Members of the Minnesota State Horticultural Society, Ladies and Gentlemen:

When I undertake to bend my mind from business cares and try to express in a clear and definite form an address worthy of the cause we represent, I can but wish that this task had fallen to the lot of some other member, better qualified to consider the many questions of interest that are to come before us. And when I read the many excellent annual addresses that have been given by my predecessors, I feel that your selection has been unwise. With this introductory, we come directly to our subject for this evening, with reference to a few points, as Shakspeare would say, "to leave no rules as blotches in the work" of horticulture.

HORTICULTURE.

What does it mean? Webster says, gardening; "The art of cultivating the garden." Those who follow its pursuits can be truly counted benefactors of mankind. It is an art worthy of the most intelligent research, capable of affording great pleasure to its devotees, and success can only be attained in it by constant care and vigilance. In this, as in other pursuits, only the cautious, calculating, painstaking investigator will become eminently successful in a climate like ours. To quote from an essay by G. W. Lawton, of Michigan: "No weariness in fruit growing is tolerated in mind or body if one would succeed; activity in both are prerequisites."

Passable crops may be raised by those not noted for great industry, but to make a good profitable business it must be conducted on business and scientific principles. The success we have attained has been by those who have chosen their location for operation with care, given thought to the preparation of their grounds, made judicious selections of varieties, planted intelligently and given proper protection against drouths, by cultivation, or mulching. The ambition and enthusiasm of one loving his profession will overcome all obstacles and make success of what would otherwise prove a failure. In some of its departments experiments can be finished in a few weeks or months; in others it is a life work, and in a few it requires the energy and patient toil of successive generations. If it is truly said that "time will accomplish all things;" we can hope and work on, believing that we may yet be able to produce hardy fruits for this vast area of country that has hitherto proved so uninviting to horticulturists.

To those not personally acquainted with experimenting in horticulture it seems an easy thing to grow fine fruits, flowers and vegetables; but the experience of those who have devoted the best part of their lives to this health-giving employment proves it otherwise.

When I look around upon these horticulturists with heads whitening with age, and think what results they might have attained had they devoted themselves as assiduously to other pursuits; what opportunities they have lost, what deprivations their families have undergone; when with only discouragements, losses, blighted hopes, failures in the past and utter ruin staring them in the face, oftentimes without a cent in their pockets, home

devoid of every comfort, wife shoeless and children crying for bread, they have worked on with devotion worthy better results. Think you politicians, lawyers, doctors, mechanics, artisans, ministers of the gospel, that you have been more devoted to your professions than these workers that place upon your tables luscious fruits, in your parlors and drawing rooms, beautiful flowers, and surround your homes with taste and adornment? Have you ever stopped to think how much you owe to this profession? Whatever success we have attained has been by patient, painstaking research, gleaned a little knowledge here and there; but the greatest teacher has been close observation and practical experience in the garden, the orchard and on the farm.

God has instituted certain laws with certain principles for governing his universe, and man must conform to those laws to obtain certain results. That there is a cause for all our failures no one doubts. The reason for our want of success in certain experiments has occupied the best thoughts of our leading pomologists and horticulturists hundreds of years. Whenever an attempt has been made to cultivate certain fruits above certain latitudes it has thus far proved a failure. Frost is king, and our most experienced experts in horticulture have not been able to ward off his icy touch. Many of the trees with which we have experimented will not endure a freezing temperature; others, while not killed, are seriously injured by our long winters, and it is conceded that a heavy frost in early fall, before the wood has properly matured, and while the sap is flowing, often injures trees that seem hardy enough to endure the coldest winter.

In the Minnesota Horticultural Report for 1881, page 41, Prof. Porter says: "Why vitality is destroyed by a low temperature is an unsolved question;" giving us to understand that it may be at some future time. I think we have much yet to learn in the acclimation of the Russian apple before it will prove entirely satisfactory. That it has some good points we must all admit; coming as it does inured to rigorous cold, we hope it may prove all its most sanguine friends anticipate. With these, as with all other new varieties, we should be cautious concerning extensive planting until fully persuaded that success is perched upon its banners.

In Hemsley's *Hardy Trees and Fruits*, page 563, on "Climate, its Influence on Vegetation," he says: "It is now universally conceded that no process of acclimatization can succeed in making a plant frost proof even to the extent of one degree." Now,

if this be true, can we expect great results from importation of these new Russian varieties? Should we not rather seek for hardy varieties among our own native seedlings? I do not discredit or discourage the introduction of the Russian varieties, but am glad they are received with so much favor by orchardists and experimentalists, and think it is possible that of the many we may find a few hardy enough to be worthy of cultivation, long keeping varieties of good quality.

In the words of another writer, "It is the misfortune of horticulture that there can be no fixed rules of procedure for all places, all varieties, all seasons." Experience, judgment and skill in observation, are needed by all who attempt to become proficient in our calling. Oftentimes the changing of a particular variety only a few miles is disastrous to its best growth and fruitfulness. Hence the necessity of experimental stations under the guidance of specialists to test and prove their adaptability. Some may say we have made progress slowly. Perhaps our failures and discouragements have made us overcautious; still this experience of the past may prove of benefit in the future. Where is he who has undertaken to raise fruit north of forty-four degrees that has not met with adversities? This does not dishearten a true son of horticulture; only sharpens his perceptions, increases his enthusiasm, and gives him greater appreciation of his successes. Do you think there is one among them that regrets enlisting in this good cause? They each have tried to prove that good fruit can be raised in all parts of our state, which has entailed upon us a large amount of experimental work as a necessity, and although not conducted in the most scientific manner, it has given us food for thought (if not for our stomachs) and helped to develop in us a more intelligent perception of the magnitude of the work.

Some croaker or critic has said that apple trees do not live long enough to be profitable. George J. Kellogg, of Wisconsin, says: "The most profitable pear out of fifty planted was one that never leaved out." This question of the longevity of the apple tree is of little moment, for if fruitful in a very few years it will pay good returns. What did Pliny say of this branch of horticulture over 1800 years ago? "The apple becomes old sooner than any other tree, and the fruit becomes less and is subject to attacks from insects while on the tree." Even though a large proportion die early we shall continue planting to the end of time. We should leave no stone unturned that may assist in developing

this branch of horticulture, and even if the great secret of success is not solved by this generation, we can but think the thoughtful research and experiments of some of the most intelligent pomologists of this and the old world may result in producing fruit hardy enough for every locality.

EXPERIMENTAL STATIONS

are just at this time receiving attention in both the National and State legislatures, and we most heartily sanction the well-directed efforts that are being put forth to pass the Hatch bill, so-called, when we may look for results that will be of great benefit to the northern portion of the United States; and every friend of horticulture needs to help carry forward this movement so ably begun and zealously worked for.

Norman J. Colman, United States Commissioner of Agriculture, in his last annual report, page 32, says:

"I have been able to establish during the year a pomological division in this department. The satisfaction of many leading thinkers with this departure has been generously expressed, not only through correspondence, but through offers of hearty co-operation in the methods employed to establish the division in a proper way. It is too early in the history of the division to enumerate definite results, but there is every prospect that, if properly encouraged, we shall be able to furnish the country, and especially its pomological and horticultural industries, with information of value. The United States contains some of the largest and best adapted fruit-producing regions in the world. Farmers everywhere are beginning to give thought to the necessity of diversification, and, naturally, a fruit orchard suggests itself as the fit successor of those crops which year after year have been exhausting his soil and lessening his annual profits more and more. The all-important step to the farmer then is necessarily the first one. What can science and the latest results of experience and information teach him in the matter of adaptation of fruit trees to particular soils and climate? This is what the division will endeavor to undertake to set forth. Different pomological experimenters, as well as agricultural colleges, have generously offered their grounds and personal labors to assist in any experiments that may be instituted.

"We may also make investigation relative to foreign fruits and the probability of their successful importation and devel-

opment in American soil, to meet the demands of local markets; we may ascertain the habit of every fruit not now known, and in divers ways assist an industry whose annual product probably represents a value of \$150,000,000 and is an important one to the United States. Our people need to plant intelligently as well as to reap intelligence through public schools, and it is just as much the province of the general government to assist them in one as in the other. Horticulture is elevating in all its tendencies, and, by advancing and protecting and promoting this and other branches of agriculture, our people will advance in those paths which lead to moral, intellectual and prosperous citizenship."

This is encouragement in the right direction, and with our central experimental station at the State University Agricultural Farm, and proper lines diverging all over our State, each pursuing experiments according to their facilities, we may in the near future expect marked results. Leaving this matter with them, let us devote our time and energies for the present to the improvement of small fruits, vegetables, shade and ornamental trees and shrubs, such varieties as can be successfully propagated and grown in our gardens, lawns and parks. Here is food for thought worthy of our attention; one that, if treated in the proper manner, should interest our sons and daughters to become useful members in our Society.

HORTICULTURAL EDUCATION.

This brings us to a point of great importance to our organization. How shall we increase our membership and create an interest and desire among our boys and girls for a horticultural education? The following is an extract from a letter received from Commissioner Colman:

"Your reference to having our schools teach the primary principles of horticulture is one that has been frequently broached and urged with more or less persistency, but this is a matter for action on the part of the superintendents of public instruction or the school boards of the several states. Text-books might easily be introduced."

Here is a suggestion regarding a much needed reform in the education of our rural population. A horticultural kindergarten may be one of the possibilities of the future in which may be taught the first rudiments of pomology and horticulture. All

education should have special reference to the occupation to be pursued. Feed a boy's mind with dime novels and reading from *The Police Gazette* and he will be a fit subject for your reformatory prisons. Give his mind horticultural food and the chances are he will become a horticulturist, pomologist, or farmer. It is said that first impressions on the mind of children are lasting and carried all through life. Then decorate the walls of your school rooms in part with instructive pictures of beautiful fruits, flowers and vegetables as object lessons; remodel your text-books by introducing in them practical horticultural teaching, and your sons and daughters, with tastes refined and elevated, will become producers of contented, happy homes and ornaments to society, and our industrial organizations of the next generation will receive the accessions they so much need.

One horticultural writer says: "The best means for the promotion of horticulture are those that will the most effectually overcome the obstacles in the way. One obstacle is a lack of taste for the business; another a lack of knowledge of the different varieties of fruits and flowers and the most approved methods of culture."

ENTOMOLOGY.

Our entomologist, Prof. N. H. Winchell, in the report of last year, made some recommendations that need your attention the present session. They will be found on pages 296-7 of the report of the Society for 1886.

Entomology is closely related to the interests of all classes of producers from the soil. It teaches us how to guard our crops from attacks and depredations of all insects, as well as the benefits to be derived from our insect friends. I herewith present a few extracts from a lecture given before the American Pomological Society, in 1886, by A. J. Cook, of the Agricultural College of Michigan:

"Prof. J. A. Litner observes that insects always impose a heavy tax upon the products of man's labor, and often manifest a desire to wrest from him the entire results of a season's toil. It has been estimated that each plant serves six species of insects for food. The names are given of one hundred and seventy-nine species of insects that are known to attack the apple. The Hessian fly often lays tribute to \$20,000,000 worth of wheat in one year in a single state. The chinch bug has destroyed \$75,000,000 worth of corn in a single season in Illinois. Thus we

see that this problem is one of great political and economic importance, and one worthy the consideration of our best statesmen, and the fact that we have legislators even who sneer at the word bug and at the study of bugs, and research in the matter of insect despoilation, shows that we have weeds in our legislative halls as well as in our own gardens. The latter are plants out of place; the former men out of place."

I sometimes fear that nothing less than a plague of the Hessian fly, wheat midge, cut worm, or army worm, will induce our legislature to make suitable appropriations for carrying on the investigations of insect depredations so much needed at the present time in our state. I quote from Prof. Winchell's report: "I would recommend renewed effort be made to secure an appropriation by the State Legislature for the necessary expense of a state entomologist."

TREE PEDDLERS.

From correspondence received the past season I judge the "festive" tree agent has been working his old racket, passing his wares upon the unsuspecting grangers, mechanics and artisans, in all walks of life. As a class they have their stories well learned; very winning are their descriptions of all they have, so fine, so cheap, and so hardy, and many of them have more "cheek" than a government mule. We do not oppose or ignore honest dealing, but when we find their stock in most cases entirely unadapted to the localities in which it is to be planted, much of it dead before delivery, never leaving out, and what survives the summer is sure to die the coming winter, and the prices from four to six times higher than any reliable nurseryman's, we think they should be discountenanced by all classes interested in the future welfare of our State. If their stock was passably hardy or adapted to the localities in which it was to be planted it would be much better. It is estimated that there has been over \$200,000 worth of all kinds of nursery stock disposed of in our State the past year; fully one-half unfitted for this climate. This money parted with for trash, worse than thrown away, gives cause for discouragement to many new beginners in fruit growing and home adornment.

If there is any class of commerce that needs attention and regulation by legislation at the present time in the interests of the taxpayers, it should be for the suppression of this dissembler,

the tree peddler. We need a law governing the sale of all classes of nursery stock through itinerant tree agents by requiring them to make application to the town clerk for a proper license, to be good for that town only, also that he shall deposit lists, with prices attached of what he proposes to sell, and whenever he is found selling or delivering stock not in accordance with said duplicate list, he shall be fined and the stock consigned to the brush heap to be burned.

This may seem a little harsh but it is sufficient only to protect the interests of a large class of people who have not a horticultural education. If honest nurserymen and agents look at this in the right light they will see a larger field for introducing their hardy stock, which will prove a blessing rather than a curse to our horticultural interests all over the State. This may not be the best way of reaching this evil, but I have thrown out ideas enough to set you to thinking and you can do with them what seems best.

ORGANIZATION AND COMMITTEES.

Our Society needs greater interest and enthusiasm among its members, a better organization of its committees with special reference to the work they have to perform. Many members think their responsibility for our success should cease when they have joined the Society, paid their dollar and received the reports furnished them. Now, this is not right; each should feel that on him rests a responsibility, and to derive the greatest benefits, he should be willing to undertake any duty placed in his charge. All committees should be constituted and arranged with special reference to their tastes, wishes and desires as far as possible. I would therefore suggest that a nominating committee of five persons be appointed, whose duty it shall be to recommend new standing committees and the names of three persons for appointment, that are qualified to arrange the work in their several departments and take full charge of them at all exhibitions of the Society, and prepare reports at the end of the year, to be presented at the annual winter meeting.

I would recommend the following new committees to be created: committee on apples, pears and plums; on grapes and their seedlings; on exploration for new fruits and flowers adapted to our state; on green houses and floriculture; on our native fruits; on deciduous trees and shrubs; on evergreens and

conifers; on marketing packages, and new horticultural appliances; on library; on bread, pickles, preserves and canned goods; on honey, sugars and syrups.

SECRETARY.

The responsibility for the success of our Society for the past two years has rested largely with our worthy Secretary—the right man in the right place, and, if possible, he should be retained there. Never before in the history of our organization have we had so efficient, reliable work performed by the Secretary, as by the present incumbent of the office. He has accomplished more work at a less cost to the Society than any man before employed. Our reports under his management can be pointed to with pride, and are worthy of exchange with all similar organizations in the United States. Of all officers in the Society, the Secretary should receive full recompense for his services, and I most heartily recommend an increase in his salary for the coming year.

STATE FAIR GROUNDS.

I hope our brother co-workers in the agricultural board will not think I am trespassing on forbidden ground in bringing to the notice of our members the great necessity of utilizing the fair grounds for park purposes. By this I mean such as are not needed for the use of exhibition buildings. It has occurred to me as well as to other members of the society, that before much more is done in building, there should be properly adjusted prospective plans procured, by some competent landscape architect, for their embellishment with roads and walks bordered with trees, shrubs and plants, suitable for the best results for the education of the vast multitudes who attend our annual fairs, that would be object lessons worthy of imitation by our citizens, in surrounding their homes for the enjoyment of their friends and children. These grounds are susceptible of being made the finest in the country, at a small cost, with very little ornamentation. Nature has left her impress here in a very pleasing way, and art will be helped very much in bringing out those points of greatest beauty, with very little difficulty.

Following is an extract from a noted work on the subject:

“The landscape gardener has most of his objects laid down. He must accept of locality with its natural features and the contour of the ground, which often prescribes a particular treatment; he must conceal deformities, elicit existing but apparent beauties, and to adorn whatever is susceptible of improvement. A man may thrust his preconceived fancies on a place as fast as he can stake them out, but if the treatment is to be adjusted to the ground, harmony and effect preserved, as they always ought to be, time would be given for the laws of suggestion to come into fair play. It is sometimes useless to attempt to undertake improvements of this character without consulting those that have made the art of landscaping a study.”

I wish to throw out an idea for your thoughtful consideration. This improvement may be delayed for a while for want of means to carry it forward, or it may be pushed with energy and wise foresight at once; but whatever action is taken, can not our members do something to help incite this undertaking, by furnishing or supplying in part a large proportion of the trees, shrubs and plants for the embellishment of this agricultural and horticultural home of all the industries. Let each individual member signify to our secretary what varieties they can furnish, and the present spring set apart some plat of ground in which to plant, care for and train a few specimens, which when the time comes can be transplanted, and for you and your children's reward you shall have the satisfaction of feeling that you have contributed something toward beautifying and adorning these exhibition grounds, and in future years shall point with pride to these living monuments that shall dispense comfort, enjoyment and instruction to our children and the generations to follow, and be reminders of what we, as an organization, have helped to accomplish.

HARMONY OF ACTION.

One author says: “Every vegetable and animal constitutes a machine of greater or less complexity, composed of a variety of parts dependent on each other, and acting all of them to produce a certain result, and on this account called organized beings. Thus defined, each member becomes a constituent part of the whole organization, and all are dependent on each other to accomplish certain ends.” So we, as an organization with diversified interests and desires, striving to accomplish the greatest good to the largest number, casting the unpleasant

things out of our minds and sight, striving ever to teach and be taught, believing that we individually are responsible for the prosperity of our society and the development of all its interests, physically, mentally and morally.

RETROSPECTIVE.

When we look back over the twenty years of our connection with this Society, and see the great unity of purpose that has always prevailed, all fraternizing more like brothers than individual members of society, I assure you that we all have feelings that call for gratitude to know that so great harmony has existed. At times there have been little clouds of dissension perceptible, but with a little tact and foresight, along with the prevailing good judgment of our officers and members, they have been dispelled.

PREMIUMS AND PREMIUM LISTS.

I wish to record a kind word in recognition of the friendly manner in which the executive committee of our society was received by the State Board of Agriculture on the presentation of our wishes concerning the revision of their premium list for the last exhibition. After a careful inspection of the old lists and a free discussion on the inequality of dividing the amounts to be apportioned to the several classes, we found they were generous in giving us very near what we wished for in the three classes which were set aside for our society to superintend and manage, nearly \$2,000. This amount we divided, giving to fruits \$716; greenhouse and cut flowers, \$354; vegetables, \$520; bread, honey, etc., \$325. We increased the premiums on single plates and cut the amount down on sweepstakes; we also made some changes favoring outside counties, which gave offence to some organizations in the two cities.

The coming year I recommend a special list of premiums on vegetables for outside counties to compete for, and the giving of exhibitors in the three counties of Hennepin, Ramsey and Dakota a special sweepstakes for county exhibit. This, I think, will be fair, and in a measure appease their righteous indignation.

The revision of the premium list should be put into the hands of a competent committee early that they may prepare it before the busy season of spring.

The exhibit of fruits last September at the fair grounds was the finest in quality as well as largest in quantity that we have had.

and was very favorably commented upon by visitors from abroad; especially the apple and grape show. Friend Tuttle's Russians were a drawing card, if we were to judge from the packed crowd of earnest questioners in front of his exhibit. The exhibit from the State Fruit Farm of seedlings was very fine, consisting of many varieties of worth to the fruit growers of the Northwest. The exhibit of wild and native plums, although late in the season for them, was very good and gives great hope of their future development; we need to encourage greater activity in their selection and propagation. One variety of particular merit is the Rollingsstone which I consider one of our best for all purposes.

Bread, pickles and preserves were received in large quantities, showing what the ladies can do when they come to the front with their handiwork in this department; and one wonderful feature of this exhibit was so many kinds of superior quality, so much so as to give the committees great difficulty in judging and placing the ribbons. Bread and cake shown by the young lady exhibitors, was very fine, giving much cause for congratulation, that whoever the lucky man is that wins, will not eat heavy, sour bread — one of the abominations of the past!

The report from the vegetable department will be attended to by Brother Grimes, its superintendent.

The greenhouse department was very well represented by three leading firms of our state, who exhibited many fine specimens of the floral kingdom. In this department we find one of the worst problems to solve satisfactorily, in the finding of proper committees to pass judgment and make awards that shall be just right. Committee work at our state fairs and exhibitions is a good deal of a thankless job, they always getting more censure than praise.

I wish to call your attention to the propriety of procuring in the future proper appliances for making exhibitions in the central portion of Horticultural Hall and around the fountain. These fixtures are very necessary to provide means of making your displays instructive and attractive.

Our state, if not noted for its extensive orchards of beautiful, long-lived trees, can boast of a few never failing natural productions that vie with the world. In its crops of pine trees, icy crystals and howling "blizzards," we find those that thrive and grow without the fostering care of man; and we hope with the aid and energetic persistency of our patient investigators, to accomplish in the future the development of a pomology pecu-

liarly adapted to our broad prairies, diversified hillsides, sheltered valleys and along the shores of our many beautiful lakes, with varieties that shall put to blush, for quality and exterior polish, those now already in cultivation.

AMERICAN POMOLOGICAL SOCIETY.

The meeting of the American Pomological Society, to be held at Boston in September next, is an event our Society should not overlook; but should be ably represented by delegates with as fine an exhibition of fruits as can be collected from our orchards and gardens. This would incur an expenditure to the Society of perhaps three hundred dollars, in order to make an exhibit of credit to the State. The propriety of incurring this expense is a matter for your consideration. One or more delegates should be selected whether an exhibit is made or not.

NECROLOGY.

On the sixteenth of last December there went out from earth the spirit of one of the most noted men in the science of pomology of the present century, the honored president of the American Pomological Society, Hon. Marshall P. Wilder, of Roxbury, Massachusetts, and an honorary life member of this Society, at the ripe age of eighty-eight years.

He died as he lived universally respected and beloved, like fruits in their season he passed, but his name will ever be revered and he will be remembered as the great leader in American pomology to the end of time. To quote what he wrote of another noted horticulturist is very applicable now:

"Few are aware of the great revolution that has taken place in fruit culture since the establishment of this national organization, the American Pomological Society, under the care and guidance of this man, whose desire for the cultivation of the useful and ambition to sow broadcast love, kindness and fraternal affection, led him to spend his life in the promotion of our art."

I shall ever hold dear in my memory the remembrance of the meeting of this grand old society in Boston, in 1873, and the new impulse I at that time received. As I look back through the lapse of years intervening I can see to-day that superb exhibition of fruits and flowers, the finest this country had ever

brought together. It was a continuous ovation under the guiding mind and hand of this great and good man; an event which will be referred to by those present as a bright spot in the work for the promotion of this great industry. I look back at the banquet given as a parting compliment, at Music Hall, at this wedding feast of the silver anniversary of the society, celebrated as its crowning glory, under the auspices of the most sumptuous hospitality, with this grand man the center of attraction, occupying the place of honor on the platform, flanked on either side by distinguished gentlemen and ladies, guests of the association from the North, the South, the East and the West. After this sumptuous banquet was served President Strong, of the Massachusetts society, made a speech of welcome and offered the following sentiment: "Hon. Marshall Pinckney Wilder; pomology and horticulture alike claim him as one of their most devoted and self-sacrificing patrons, and vie with each other in doing him honor."

To give an idea of his knowledge and research I read an extract from his reply.

President Wilder said: "The present occasion will be memorable in the annals of American pomology, not only as marking an important epoch in the history of our society, but for the large assemblage of the best cultivated of our land and the remarkable collection of fruits which has graced the exhibition of the week. But the thought which engrosses my mind at the present moment is the wonderful progress of fruit culture during the present century.

"True, our Puritan fathers in planting the seeds of empire did not forget to plant some fruit trees. Gov. Endicott at Salem, Gov. Stuyvesant at New York, and Peregrine White at Plymouth planted their pear and apple trees. But during the first century and a half very little attention was given to the cultivation of fruit. It was not until after the establishment of the London and Paris Horticultural societies, the former in 1808 and the latter in 1827, that any considerable progress had been made in the improvement of fruits. In fact, there were very few horticultural or agricultural societies extant until the beginning of the present century. The first agricultural society established on this continent was the Philadelphia Society for the Promotion of Agriculture in 1785, of which our own Timothy Pickering was the first secretary. It is but just to state that a similar society had been started in South Carolina a month previous, but I believe

does not now survive. The second agricultural society in America was the Massachusetts Society for Promoting Agriculture, formed in 1792, whose delegates honor us with their presence. But to confine myself to horticultural societies. The first, still existing, in America was the Pennsylvania Horticultural Society, established in 1827; the second was the Massachusetts Horticultural Society, formed in 1829. The first national pomological organization of which we have any knowledge was the American Pomological Society, whose quarter centennial we this day celebrate. Now there are more than 1,000 agricultural, horticultural and kindred associations registered on the books of the department at Washington.

"You have been pleased to allude to me in connection with horticulture as well as pomology. Well, sir, let me say that, from my earliest years, I can not remember the time when I did not love the cultivation of the soil, and the more I am brought into communion with nature, the more I am full of gratitude to the Giver of all good that He gave me a love for fruits and flowers, and cast my lot where I might enjoy them and have sweet intercourse with these lovely objects of creation. And who does not look with wonder and admiration on the infinitude, beauty and perfection of these works of the Hand Divine. The enameled blossom bespangling the orchard with starry spray scarcely less numerous than the glittering host above, dancing in rainbow hues and flinging on the breeze a fragrance richer than Ceylon's Isles, sweet harbinger of bountiful harvest; the luscious fruits, God's best gift to man, save woman — the velvet peach, mantled with beauty's softest blush. and vying with the orieny of the morning; the delicious plum, veiled with silvery bloom over robes of purple or cloth of vegetable gold; the royal grape, the brilliant cherry, the melting pear and the burnished apple, tempting human taste from the mother of our race to her last fair daughter. But what pencil can sketch the changing hues, the magnificence and glory when Pomona pours from her ever-flowing lap the very treasures of the ripening year. Here are creations originally pronounced 'very good.' Here are beauties which fade only to reappear again.

"From the beginning there seems to have been an intimate connection between trees and man. Trees are spoken of as though man could not live without them, as though divine beneficence had given them to us as companions for life, and as emblems of all the beautiful in imagery, excellent in character, or

hopeful in destiny. Our trees—from the opening bud to the golden harvest—from the laying off their autumnal livery, and during their rest in winter's shroud, waiting a resurrection to a new and superior life—all are eloquent preachers, proclaiming to our inmost soul, 'The hand that made us is divine.' God gave us trees adorned with inimitable beauty, pleasant to the sight and good for food. He gave us also a natural and instinctive love for them. Witness the love of Abraham desiring to have all the trees that were in the field, and in the border round about—of Rosseau longing to be laid under his own sequestered trees—of Temple directing that his heart should be buried beneath the tree of his own planting—of Washington returning to the cherished groves of Mount Vernon—of Webster reclining in life, and sleeping in death under the umbrageous elms of Marshfield—of our own Downing, whose genius lives in trees which adorn many a lovely landscape, many a beautiful garden, and many a fruitful orchard in our land."

I can render no more fitting close to this tribute to the memory of one so dearly beloved by all those who love the true, the beautiful and sublime, than by quoting the closing remark of Gov. Washburn, of Massachusetts, to the next sentiment, "Massachusetts:"

"But my friends, I recollected that although he might pass away, his works would live after him, and the monument he had been able to rear and perpetuate would stand when the mere monuments of granite and marble should be forgotten; this monument which will speak in language too eloquent ever to be forgotten over this broad land of ours."

On motion the following committee was chosen on the president's annual address, viz.: Prof. D. R. Maginnis, J. S. Harris and C. L. Smith.



IN. MEMORIAM.

Mr. Harris. Mr. President, it seems to me appropriate at this time that some action should be taken with reference to the matter of the death of the Hon. Marshall P Wilder, although from the lateness of the hour I fear we can not do the subject justice. As a member of the Committee on Obituary I have drafted some resolutions.

The last fifty years is marked as the period of the greatest improvement and progress in horticulture and kindred arts and sciences recorded in the history of the world, and most of these improvements have been instituted and developed through the disinterested labors of men born since, or about the beginning of, the present century, who have made their lives a blessing to humanity, and crowned themselves with unfading laurels. One by one these remarkable men of the age are laying down their armor and departing, to join the greater number in that happy realm, of which that first "Eden" was only an inspiration. Within a few years we have mourned the departure of a Warder, Kirtland, Bryant, Vick, Downing and many others, whose well-ordered lives, devoted to the public good in the development of horticulture in our country, had earned names as useful men of their time, that caused their death to be regarded as more than a national loss. And now we have received the sad message informing us that the greatest and best, the acknowledged leader of them all, the great and good man, the venerable Marshall P. Wilder, the president of the American Pomological Society, has gone over to the other shore and joined that band of worthies.

Mr Wilder was a man who was a model worthy of being patterned after. I have read his addresses and articles published in various papers throughout the country, and have never seen a word from his pen, or listened to a word that he has spoken, but that seemed to me to be words of wisdom and words fitly spoken. He was a man of the greatest charity, who ranked far above the great majority of his fellows; he seemed to have a boundless love for everybody. It is said of him that there was no man so objectionable but he could see some good in him and point it out to others. He was one of the most remarkable of men in presiding in horticultural conventions. He was an honorary life member of our Society and seemed to have a fatherly care over it. We have frequently received communications from

him and he has always spoken encouraging words and seemed to take a deep interest in our work.

Marshall Pickney Wilder died at his home in Roxbury, Mass., Dec. 16, 1886. He was born at Rindge, N. H., Sept. 22, 1798. Of his early history we learn that he commenced attending the public school when four years old; at twelve he entered the New Ipswich academy where he remained one year and then pursued his studies for three years under a private tutor. At the age of sixteen his father gave him the choice of preparing himself for the life of a farmer, merchant or professional man. He chose the first and spent the next few years upon his father's farm, and among the lakes and forests of his native state where he laid the foundation for the enduring health to which he was greatly indebted for the mental and physical energy that has distinguished his subsequent career, and there he imbibed inspirations and a love for everything beautiful in nature, that had much to do in moulding his long and useful life. In 1825 he removed to Boston, Mass., and engaged in the mercantile business, in which he amassed a comfortable fortune and attained a high position as a business man, and no man in our country has been honored with a greater number of important trusts. But it is in the pomological and horticultural world where he was most widely and favorably known and his name has been synonymous with progress in horticulture and pomology throughout North America for more than half a century. His name is a household word in every home in our land where good fruits are appreciated, and it has been truthfully said of him that he was one who by his industry and determination has not only conferred lasting benefits upon his own country but has by his careful researches in hybridizing and selections in fruit culture laid the horticulturists of all nations under heavy obligations. We read of him in 1829 as one of the prominent members of the Massachusetts Horticultural Society, and ever after as one of its most zealous and efficient members, and for many years its president. He was its president in 1844 when it laid the corner stone of Horticultural Hall, which is believed to be the first building ever erected by a horticultural society for its exhibitions.

In 1848, as president of the Massachusetts Horticultural Society, he headed a circular addressed to all the horticultural societies and leading pomologists throughout the country, calling a convention in New York, which was held in October, and re-

sulted in the organization of the American Pomological Society, of which he was chosen the first president, and has been re-elected at every subsequent meeting, and held the office until the hour of his death. To him the State Agricultural College at Amherst owes its existence, and every society or movement for the promotion of agriculture or horticulture throughout our country has received his kindest sympathy and been strengthened by his wise councils.

In his addresses to the American Pomological Society he has set up a lighthouse and flung a banner to the breeze from its highest tower, upon which is inscribed in letters of light the method for the sure solution of the fruit question adapted for all lands: "Plant the most mature and perfect seeds of the most hardy, vigorous and valuable varieties; as a shorter process insuring more certain and happy results, cross and hybridize our finest kinds for still greater excellence. Go on; go on while you live, and when we are gone others will rise up to chant our old song:

Plant the best seeds of all your best fruit,
Good fruits to raise that some lands may suit;
Fruits which shall live their blessings to shed
On millions of souls when you are dead.
Plant; plant your best seeds, no longer doubt
The beautiful fruits you may create;
Fruits which perchance your name may enshrine
In emblems of beauty and life to shine."

The following beautiful paragraph occurs at the conclusion of his last address to the American Pomological Society at Grand Rapids, Michigan, in 1885: "Fruits are the overflow of nature's bounty — gems of the skies which are dropped down to beautify the earth, charm the sight, gratify the taste and minister to the enjoyment of life, and the more we realize this the more shall we appreciate the Divine goodness to us and the duty of providing them for others." May these parting words of our wise and noble friend be indelibly imprinted upon our memory and stimulate us to go forth planting orchards and gardens that shall be fitting and enduring monuments to his memory.

The father of American pomology lived long beyond the age commonly allotted to man, and continued his life work to its close. Sadly do we mourn his loss and cherish his name as one of the most useful men of his time, a name that shall be handed down all through the coming ages, honored and revered.

Resolved, That the members of The Minnesota State Horticultural Society have learned with deep and sincere regret of the death of the aged and highly respected honorary member of this Society, Hon. Marshall P. Wilder.

Resolved, That the members of this Society appreciate the life-long labors of Mr. Wilder, his devotion to the development of pomology in our country and his thorough earnestness in endeavoring to awaken a higher appreciation of trees, fruits and flowers among the people, and we commend his example to all horticulturists of future generations.

Resolved, That we offer our deep sympathy to his friends in this their great bereavement, and to the American Pomological Society, the Massachusetts Horticultural Society and other societies of which he was an honored member, and that as a token of our profound respect for his memory, these proceedings be entered on our records and copies of our transactions be forwarded to his family, to the secretaries of the above societies and to the secretary of the New England Historical Genealogical Society.

The resolutions were unanimously adopted, and on motion the meeting then adjourned till Wednesday morning.



MORNING SESSION.

SECOND DAY, WEDNESDAY, JAN. 19, 1887.

The meeting was called to order Wednesday morning at 9:30 by President Elliot.

The president stated the first thing in order would be the report of the Seedling Commission.

REPORT ON SEEDLING FRUITS.

By J. S. Harris, La Crescent.

Our first official visit was made at Granite Falls, June 28, 1886, where we found a live and strong county horticultural society with O. E. Saunders, president, and A. B. Regester, secretary. We enjoyed the pleasure of joining them in their summer meeting and small fruit show. The meeting was held in Regester's grove, was well attended and a success. Addresses were given on evergreen planting, strawberry growing, birds, insects, etc., and the different subjects were pretty thoroughly discussed. Another interesting feature of the meeting was individual reports by the members upon the trees planted the past season. Strawberries recommended for cultivation were the Crescent and Wilson, and one speaker said if they could not succeed with these we had better let strawberries alone. The strawberries, raspberries, currants and gooseberries upon exhibition were very superior, and all of these fruits do well here when mulched and given clean cultivation, except there is considerable complaint about the Doolittle Raspberry blighting badly. An examination of the plants failed to reveal the cause, unless it came from injury to the canes by the severity of the winter. If that be the cause, covering with prairie hay might obviate the difficulty.

A goodly number of ladies were in attendance; they brought along well-filled lunch baskets the contents of which

were spread upon ample tables in the grove, and we were invited to partake of an elegant horticultural dinner. It was one of the best meetings of the kind we ever attended and we are pleased to add that this society promises to accomplish a good work in that locality.

Our next visit was made at Excelsior August 7th, a place that has gained considerable notoriety for the large quantity of very superior small fruits and grapes grown there, and for being the place where the State Experimental Fruit Farm is located. We went through several vineyards and found the grape crop a large one and the fruit very fine, the Delaware and Concord taking the lead in the varieties under cultivation.

THE STATE FRUIT FARM.

Our objective point was the State Experimental Fruit Farm. We found Mr. P. M. Gideon, the superintendent, at home and ready to conduct us through the orchards and nurseries and to explain everything for us. He has so often explained his method of conducting experiments that it is needless for us to repeat it. We found in the orchard, which apparently has been set six or seven years, and from that time down to the present season, a considerable variety of apples of his own origination, intermingled with dead and dying varieties that had been set for the purpose of fertilizing and crossing the fruit for said purposes. The living trees are evidently crosses between Duchess, Wealthy and varieties of the Siberian species. Many of the trees were bending down under the weight of fruit; some of the fruit was of fair size and very beautiful to look at. The season was hardly enough advanced to judge of the quality of several of the varieties. Taking the Duchess of Oldenburg as a standard for hardiness, many of the trees are exceedingly hardy, and some five or six of them may occupy an important place in our lists of varieties for trying situations. Varieties named August and September are profuse bearers, of a good, medium-size fruit, of excellent quality for cooking and drying. The Gideon is an apple of good appearance and one of the latest keepers; tree productive and apparently hardy, but in this locality subject to blight. Some seedling trees, fruiting for the first time, look very promising and may prove longer keepers. It may be well to add here that the first fruiting of a seedling is not always a safe criterion of its worth; fruit frequently improves in flavor, size and keeping

quality as trees become older. We noticed two varieties of Siberian, the Cherry Red, and Florence, that ought to supersede some varieties that are now being extensively planted.

In a younger seedling orchard we saw some very fine trees, and a few of them were carrying specimens of fruit; one of them we would like to know more about. It had a striking resemblance to the Rhode Island Greening.

IN M'LEOD COUNTY.

August 9th and 10th we visited Glencoe, Sumter and other points in McLeod County. In reaching this region we pass over the Hastings & Dakota Railroad from Minneapolis. The country along the road is rolling and much of it has been heavily timbered, showing a deep, rich soil, with a more or less tenacious subsoil, and from its striking similarity to some of the best fruit districts in America, we are led to entertain the opinion that it will yet enjoy notoriety, as a good apple and grape-producing district.

Siberians, Duchess, and some trees of the Wealthy are looking fairly well and bearing a good crop of fruit. Most of the farms have an abundance of timber. Most conspicuous among the varieties we notice sugar maple, American elm, black and white ash, three or four species of oak, bitternut, hickory, butternut, basswood and ironwood. In underbrush the predominating species are hazel, prickly ash, wild grapes and wild rose. About Glencoe considerable attention is being paid to growing small fruits and vegetables. In the village gardens, strawberries, red raspberries and currants are doing well; vegetables are remarkable for size and superior quality. The great drought of the season has not proved as damaging here as in many other sections of the State.

Mr. Cutler, of Sumter, joined us and we visited a farm about five miles south of Glencoe for the purpose of examining some seedling apple trees that had been reported as promising. A number of trees upon this farm had fruited in previous years but all save one had succumbed to the Frost King in 1884; this one the owner says was the poorest in the lot, is carrying some fruit. It may be hardy but the trunk has been badly injured by borers. There is upon the place a younger lot of seedlings that will soon commence fruiting. As the seeds were procured from the state of New York we have very little hopes of any good results from them.

From here we go to Mr. Cutler's farm at Sumter. He is making a success with small fruits. Crescent strawberry fertilized with Wilson and Glendale is proving the most profitable. Where the soil is not too rich they hold up well for shipping to points twelve to fifteen hours distant by mail. The Turner raspberry is doing well; Cuthbert is very promising, Stone's Hardy blackberry is not proving satisfactory. Mr. Crandall and others of his neighbors are succeeding well with grapes and small fruit.

IN BLUE EARTH COUNTY.

August 13th, at Mankato.—We visit Mankato and spend the day in visiting gardens, vineyards, etc.

Hon. Daniel Buck has a large garden devoted almost exclusively to the growing of small fruits in which he engages with enthusiasm and is meeting with gratifying success. His favorite fruit is the grape and he is experimenting upon and has under cultivation thirty-three varieties. His vineyard is one of the best we have ever seen in the State, and most of the vines were carrying a heavy crop of fruit which was just beginning to color. The vines are generally vigorous and the foliage healthy. A careful examination does not reveal any appearance of mildew upon the leaves or rot on the fruit. The varieties most extensively grown are the Delaware, Concord and four or five of the best Rogers Hybrids, and for trial all of the most noted of the newer varieties; Agawam (Rogers 15) were loaded to their full capacity with the largest and best clusters we have ever seen that variety produce. Another variety, probably Barry (No. 43), is surpassing the Concord in fruiting and has the advantage of being a few days earlier in ripening. Brighton is carrying an immense crop and strikes us as proving to be one of the most valuable grapes for this State. Pocklington and Moore's Early are not fruiting as heavily but the vines are reasonably vigorous and the fruit is superb. Mr. Buck expresses the opinion that we should give more attention to the production of seedling fruits and believes it is probable we may, by continuously planting seeds of home-grown plants, originate a variety of grapes as large and vigorous as the Concord and earlier than the Champion or Moore's Early. One or two such varieties would prove a bonanza to the originator and make successful grape culture possible for every owner of land in the Northwest. He has several hundred plants started from seeds of his earliest varieties now well started; one of them, three years old, is carrying

some fruit of fine appearance. Currants, strawberries, raspberries and blackberries in several varieties are all doing well.

We also visited the vineyards of Dr. Wickersham, and find him a very successful grape grower. He is succeeding well with the older varieties, while Brighton, Pocklington and Martha are doing remarkably well. The doctor has a small orchard in bearing; many of the trees, however, were scorched by the late hard winter. We meet and form the acquaintance of David Quinn, who is a very successful grower of small fruits, and find that he is the owner of about the best orchard in this vicinity. The varieties are principally Duchess, Tetofsky, Wealthy, and Whitney and some of the newer Siberians and Hybrids. The Wealthy is considerably injured and he lost all other varieties except the above named in the very disastrous winter of 1884-5.

We believe this section of country possesses peculiar advantages for fruit culture and that large quantities of it could be profitably grown.

August 14th.—We spent an hour or two with John Mathewson who is located a little south of Ramsey, on the line of the Southern Minnesota Railroad. The orchards here are looking badly, the worst of any point we have visited. From an observation of the soil and lay of the land about here we infer nothing but the Siberians and hardiest varieties of apples will succeed. Sharp agents have traveled through here and their villainous operations have about discouraged the farmers from doing any more tree planting. Wherever tried strawberries are a wonderful success, the Crescent taking the lead. Red raspberries are also doing well; blackcaps are reported as being subject to blight. Vegetables succeed so well here that farmers have no reasonable excuse for not having their tables well supplied with them as well as with small fruits.

AT MINNESOTA CITY.

August 17th.—We spend a day at Minnesota City, about six miles above Winona. This place is historic grounds in the annals of Minnesota horticulture. Here, in 1852, John Shaw, of Penobscot County, Maine, planted a large quantity of apple seeds, many of the trees from which proved very good, and were made the nucleus of many orchards within a radius of ten miles. Many of the trees proving so hardy as to survive and produce large quantities of fruit down to the winters of 1884-5-6, setting Winona County ahead of every other county in the State for apple culture, and proving beyond a doubt that fruit could profitably

be grown. This place is the home of O. M. Lord, one of the managers of our Society's experimental stations. He is engaged in testing our native plums more extensively and thoroughly than any other party in the State, or perhaps the entire Northwest, and is gathering in for the purpose every variety that has gained local notoriety, and planting them side by side with the Rollingstone, a variety he found growing wild upon his farm. Among those that have fruited he has not found any one that surpasses that variety for general purposes, and very few that anywhere near approach it as a dessert fruit. The fruit of this variety is medium large, round, and of a purplish red color; flesh more firm than any other variety of natives we have seen, flavor very good; skin thin and nearly tasteless, and when the fruit is thoroughly ripe is easily peeled from the flesh. The fruit will keep longer after ripening and bear shipping further than most of the native plums. The trees are hardy, strong growers, of a lower, more spreading habit, than most of the Canada species.

His trees fruit annually and come into bearing when very young. We found a portion of them just ripe, and judged by the appearance that the full crop would mature within two weeks from the date of our visit. He has trees of the Cheney plum — a variety introduced by Mr. Markle, of La Crosse, Wis., — that are looking well. The Cheney proves to be the earliest and largest, and has no superior for canning and preserving, as it is almost free from acidity in skin and pit. Mr. Lord also has the De Soto in fruit, and esteems it very highly; it is a little later in ripening than the Rollingstone. A considerable number of the variety bore some fruit, but this being their first year, and the season a very dry one, we do not think it fair to make comparisons, but will say that this season the Weaver is very fine, and being a free-stone variety and a little later than the others, is very desirable. Now we think we have found a good set for the farmer's garden, viz.: Cheney, Rollingstone, De Soto and Weaver, that will afford a continuous supply of fruit for a whole month. We hope yet to find good earlier and later varieties, and that through cultivation and propagating by seedlings we shall increase the size and improve the texture and keeping qualities of this most delicious and wholesome fruit.

His apple orchard was nearly annihilated during the winter of 1884-5; nothing but a few trees of Duchess, Wealthy, Early Strawberry, and two or three other Siberians remain. These are all fruiting well this year. Mr. Lord says this is the second

time the trees have been killed upon this farm, but he considers that they lived and bore fruit long enough to pay him well. He is replanting, using such of the old varieties as had proved the most profitable, and adding, for trial, new varieties that promise well, as fast as they can be procured from reliable parties, giving preference to such as are reputed to come into early bearing.

Mr. Lord is a fine horticulturist, careful in keeping track of varieties, and we trust whoever knows of choice varieties of native plums, Russian or seedling apples, will give him an opportunity to test them.

Mr. Lord is doubtless the most successful blackberry grower in the State, and has no reason to complain of the success he has had with raspberries and strawberries.

IN FARIBAUT COUNTY.

August 21st.—Winnebago City is a prosperous village in Faribault County, one hundred and seventy miles west of the Mississippi River. Faribault County, on the southern boundary of the State, is one of the best agricultural counties in Minnesota. The general surface of the land is gently undulating; the soil is a deep, black, sandy loam, well adapted to growing grains, grasses, vegetables, and probably all varieties of the small fruits. It is essentially a prairie county, although native timbers are quite well represented, and on every hand are groves of planted timber dotting the country and affording shelter to stock and farm buildings. These groves vary in size from one to twenty acres; some of them are over twenty years old and furnish their owners with sufficient timber for fuel and the ordinary demands of the farm.

We spent a day at Winnebago City and vicinity and visited the original tree of the Hotchkish seedling apple. The seed from which the tree originated was planted by Mrs. Kimball, deceased, over twenty-five years ago. The tree has been a very prolific bearer, producing a large, green apple, said to be of excellent quality and a long keeper. Old settlers of the town pronounce it the best apple they have ever seen in the West, while it has always been as hardy as the Duchess and seemed to stand our winters perfectly, until 1883-4. In the spring of 1884 it showed signs of injury. The present owner, Dr. Beebe, fearing that it was about to die, has given it what might well be termed heroic surgery, and removed a large portion of the top. A careful examination

shows that the trunk and axils of the branches do not show signs of injury from the severity of our winters. There are no blight patches in the crotches, and the wounds made in pruning do not indicate an advanced stage of blackheart. The distance from the ground to the lower branches is five or more feet; the bark is clean and healthy; foliage large, thick and resembles the Duchess. The tree is standing in a strong blue-grass sod, and in such a position that heavy rains would run off, instead of penetrating to the roots, and there is much reasonableness in the opinion of a neighbor that the injury to the top was occasioned by excessive drought. It has not fruited this year, but has thrown a new growth of from twenty to thirty inches with no signs of blight. Further search showed that all orchards in this vicinity were more or less severely injured by the late hard winters, but not as much so as in some other portions of the State. We find the Wealthy bearing fairly well, but all the older trees are unsound.

IN CARVER COUNTY.

Upon the ninth of September the full commission met at the farm of Charles Luedloff, in Carver County.

Carver County is one of the "Big Woods" counties, one of the richest in the State, and is one of the best fruit regions in the Northwest. In 1884 there were over 20,000 apple trees in the county, producing liberally. It was the superb fruit of this county that made it possible for our State Horticultural Society to make so fine an exhibit at the meeting of the American Pomological Society, at Philadelphia, in 1883, where our apples were awarded the highest prize (the Wilder medal), in competition with every other state in the Union.

Mr. L. is a thrifty German, entertains broad and progressive ideas, is a most genial host, well versed in American and German agricultural and horticultural literature of the day, and one of the most enthusiastic experimentalists and horticulturists we ever met, and has unbounded faith in the future production of fruit in this State. He is the manager of one of our horticultural experimental stations, and is conducting experiments on a more extensive scale than any other experimentalist in the State. He has, at considerable expense and trouble, gathered together about all seedlings that have gained notoriety in the Northwest, and also has under trial about one hundred varieties of Russian apples, and other fruits, many of which promise to succeed well

in this region. But very few of them have yet arrived to a fruiting age. He has had large and fruitful orchards, but the winter of 1884-5 was very disastrous to them. However, he is not discouraged, but intends hereafter to grow principally Russians and such seedlings as give promise of success. He does not expect all of these varieties will prove successful or stand our climate, but that a number of them will prove to be perfectly hardy, and that others, through a process of selection of seedlings — like that pursued by Van Mons, in France, with the pear, and of Mr. Bull, of Massachusetts, with the native grape — will surely result in acclimatizing and improving them.

He is getting about him a very extensive collection of deciduous and evergreen trees and shrubs, from Europe and America, which, if they prove adapted to our soil and climate, will be of inestimable value for forestry and ornamental planting. His dwelling is sheltered, and the surrounding grounds ornamented with scores of elegant trees and shrubs, to secure which he must have laid tribute upon many lands.

In his garden we found every variety of vegetable that contributes to good fare upon the farmer's table, growing luxuriently. Strawberries, raspberries, blackberries and grapes were also in great abundance, all of which are succeeding very well with him. We noticed two varieties of native plums — one bearing a striking resemblance to the De Soto, and the other a free-stone of the Weaver type — which struck us as being worthy of propagation. There are numbers of other varieties which he has recently secured, with some from Russia. He has several of the new Russian poplars and willows, and from their remarkably rapid growth, healthy appearance and great beauty, we believe they will prove great acquisitions.

September 10th. — We visit the place of Andrew Peterson, at Waconia. He is a native of Sweden and the owner of a good farm, situated about two miles east of Clear Lake. Like Mr. Luedloff he is an earnest and intelligent horticulturist; his orchard is the most promising one we found in the State, and is planted largely to Russian varieties of apples, together with Duchess, Tetofsky, Wealthy, and some seedlings. The Wealthy and seedlings were generally in bad condition, the Winstead Pippin being the best. This is an apple of good size and quality, a long keeper, but we regret that it is not hardier. He thinks of discarding it, but we suggested that it might be a good variety for fertilizing Russians for seedling purposes. Mr. Peter-

son has also procured and set trees of the newer importations that have not yet fruited here. Several of the trees, in the oldest part of the orchard, were fruiting very heavily this year, and present a beautiful appearance from a long distance, owing to the large size and fine appearance of the fruit, in contrast with the dark-green foliage of the trees.

We gave the oldest of these a careful inspection and found some of them to be perfectly hardy, not showing a blemish from hard winters, blight, or any other causes. The Hibernial, Astrokoff Glass and Lieby are as fine trees as any country ever produced, and bearing the best. He thinks Hibernial and Lieby may be identical. The fruit is large, smooth and round; flavor not as good as the Greening and Rambo; excellent for cooking, and he says, "eats well when very ripe." (One eaten by us November 17th was rich, sprightly, and about as good as the Perry Russet.) The Astrokoff Glass resembles the above, except that the fruit is a little smaller and keeps some longer. Neither of them will go begging for purchasers in our Western markets when they are better known. The Christmas and Charlamoff are also promising apples. Mr. Peterson is trying several varieties of Russian pears; the trees have made a wonderful growth this year; also Russian plums, one variety has endured two winters without perceptible injury, and will soon show fruit. He has several varieties of pears and apples from Sweden, but is of the opinion that those from Russia, judging from present appearances, will do the best in Minnesota. He has put his trees to the severest test; they are in no way protected from sun, wind, heat or cold. Clean culture is the rule here, and trees in both orchard and nursery show a strong, healthy growth.

Our next official visit is made at Horticultural Hall, upon the grounds of the Southern Minnesota Fair Association, at the fair held September 14th to 17th. For report, see report of Horticulture at the Southern Minnesota Fair.

IN NOBLES COUNTY.

September 21st.—Thus far our search for that hardy and good seedling apple had not met with the success we had anticipated, although we feel compensated for our labors thus far. *Ignis-fatuus* like, whenever we have approached the spot where the prize was to have been seized it had gone, but was reported to have appeared in some other locality. While attending the late

state fair we were told there was a seedling tree at Worthington, Nobles County that was destined to create a sensation. Nobles County lies in Southwestern Minnesota, on the Iowa border, and only one county between it and Dakota. The surface of the county is a beautiful, rolling prairie, less than one acre in every hundred having any timber upon it. The soil is exceedingly fertile, being a black, sandy loam, two to four feet deep, with clay and gravel subsoil. It is said to be the most elevated land in the State, except a narrow ridge in Murray County; the highest point has an elevation of 1,300 feet above the sea. Okabena Lake is reported to be the highest water in the State, the surface being 1,570 feet above the sea level. J. H. Ludlow is the owner of the tree that we were looking for. We found him at his farm on the southeast shore of Lake Okabena, about three-fourths of a mile from Worthington. He is an enthusiastic and practical gardener and fruit grower. We spent the day in looking over his grounds, which are well adapted to most kinds of gardening. First we inspected his orchard, which is much more extensive than we expected to find in this part of the State, and in better condition. We found Duchess and Tetofsky in very fair condition, some of the Wealthy trees looking rather sickly, but carrying a heavy crop of most beautiful fruit, so heavy that he had the horizontal branches supported by ropes to prevent their breaking down. We found a row of Walbridge all dead or dying, which had never produced any fruit; also several other varieties of the reputed ironclads that were in but little better condition; and a superabundance of hybrid Siberians, trees generally hardy enough, but the fruit nearly worthless; there were also some seedlings of more or less merit. Last of all we came to the Okabena; this was the most promising seedling of its age, so far as the tree is concerned, we found in the State. The tree is more exposed than the rest of the orchard; trunk diameter is seven and one-half inches, one foot above the ground, stands perpendicular, and is over four feet to the first branches. The top is round, symmetrical and well balanced, growth strong and healthy; foliage large, thick and bears a striking resemblance to the Duchess. The wood of three-year-old branches was clean and white to the heart, grain firm, and we can not discover that the tree has ever received any injury from hard winters or blight. The fruit is of medium size, fine form, color yellow, shaded and striped with red. The quality is good, we thought better than the Wealthy; flesh crisp and juicy;

flavor sub-acid; season between the Duchess and Wealthy. Mr. L. was not the original owner of this place and did not plant the trees. The late G. J. Hoffman, at one time an active member of the State Horticultural Society, was one of the original settlers at Lake Okabena, and in 1871 or 2 planted this orchard and started a nursery here. Mr. L. says this tree and many other seedlings upon the place came from seed procured from Peter M. Gideon, and planted by Mr. Hoffman. He does not know that the tree has ever been transplanted from the place where the seed was planted. Mr. Gideon writes us that he thinks he furnished Mr. Hoffman with seeds and cions from seedlings of his own growing, about that time, and from the general appearance we think this is a seedling of the Duchess, perhaps crossed with Wealthy or Hyslop crab. For the last five or six years this tree has borne good crops regularly. The trees in this orchard are planted too closely for the best results, but we found all fruit fair and entirely free from worms or the marks of the curculio.

IN COTTONWOOD COUNTY.

We continued this trip on to Windom, Mountain Lake and other points in Cottonwood County, and attended the county fair. At Windom we met De Wain Cook, of Dale township, a wide-awake man, who is pursuing fruit culture under many disadvantages. He has discovered and is cultivating a hardy Dewberry, which, if it comes near up to what he claims for it, will prove of great value to our lists of hardy fruits. It has been cultivated here thirteen years. We have many testimonials showing its hardiness, productiveness, fair size and good quality of fruit, etc., and have secured plants and had them sent to several of our experimental stations to be tested and reported upon. At Mountain Lake we learn of a few valuable seedling Russian pears and plums, and but one orchard of Russian apples of any promise, which is a great disappointment to us, as we had frequently heard that the Mennonites living here had brought with them trees from Russia that were doing well. From all the information we could gather the varieties brought over by them had disappointed their expectations. There was no fruit exhibited at the county fair except Siberians.

October 15th.—We visited the orchard of Jacob Klein, of Houston County, to examine the tree of the variety of apples that received the award of a second premium at the last state fair as

the best seedling for all purposes. This tree and one other are the only survivors of a batch of near thirty varieties that were grown from seed planted thirty years ago. They were raised from seed procured in Canada and saved from an orchard of ungrafted trees that has now been fruiting over one hundred years. This tree has never been seriously injured, at least so far as present appearances show. The trunk measures forty-four inches in circumference two feet above the ground, is growing in clay soil, upon high ground sloping to the southeast. The trunk is clear of scars and blemishes. The top is large and open. It is standing in timothy sod and has not been mulched; is an annual bearer of very good fall fruit, and appears to be in as good condition as Duchess upon the same place. Season of fruit, October. Both surviving trees lean toward the northeast. The other has been seriously injured by sun-scald on southwest side.

IN WISCONSIN.

October 30th.— We look over the orchards and nurseries of E. Wilcox, near La Crosse, Wis. Mr. Wilcox is an enthusiastic experimentalist, and his experience in fruit growing in Eastern Minnesota and Western Wisconsin extends over a period of about twenty-five years, and during that time he has sustained many serious losses. His present orchard is in a narrow valley about three miles east of La Crosse, and his nursery upon the top of the bluff back of it and about four hundred and fifty feet above the Mississippi River. The orchard has an outlook toward the west; a part of the ground is level, but the most of it a more or less steep side hill. The soil varies from a sandy to a clayey loam, with exposures to the south, west and north. As a rule trees upon the northern slope were doing much the best, but the Duchess, Tetofsky and the Wealthy, when top-worked upon hardy stocks, were doing fairly well upon the south slope. In the experimental department he has gathered together every reputed hardy variety of seedlings that could be obtained, and a number of Russian varieties. These are generally worked upon the tops of other trees in order to first test the quality of the fruit. Several of them survived the late severe winters and are now in perfect health. As fast as they fruit and show valuable qualities they will be further tested as root grafts. Three or four of them bore fruit this season—1886. We sampled them and found one that is evidently a good keeper and perfectly hardy as a top

graft upon Transcendent crab. The fruit is medium in size, oblong round, in shape, color green, striped and splashed with pale red, flavor sprightly, sub-acid, origin unknown.

IN FARIBAULT COUNTY.

December 11th.—We called upon John Dean, one of the pioneer fruit growers of Faribault County. He is located near Blue Earth City. His bearing orchard is almost exclusively of seedlings, grown from seed procured at a cider mill in the state of New York, and planted in 1863, upon the ground where many of them now stand. Nearly all of the trees that proved hardy enough to stand until they fruited are, doubtless of Siberian crab origin, or crossed with that species. He has discarded the worst blighting varieties and such as bore worthless fruit, so that the varieties retained will run in size from the Virginia crab to double that of the Transcendent, and better in quality. All of them are excellent for cooking purposes and some of them very good for eating from the hand. All are later keepers than the Transcendent, and we should judge that some of them will keep until spring. A portion of the trees appear to be very hardy. Mr. Dean is also experimenting with the newer Russians and other hardy varieties of apples, etc.

IN RAMSEY COUNTY.

Our last official visit was made at the Agricultural College Farm, under the supervision of Prof. E. D. Porter. As we expect that his report will be published in this volume of transactions, we will only say that he is starting experiments with the Russians, and in small fruits and trees and shrubbery, and we believe that if he has the hearty co-operation of the State Horticultural Society, and the experienced fruit growers of the State, we shall soon obtain valuable results.

IN CONCLUSION.

In conclusion we have, in performing the duties assigned to us, traveled over a considerable portion of Southern and Eastern Minnesota. We wish that we could report better results. The most promising seedling tree we have seen is the Okabena in Nobles County. The next most promising one we have heard of is the Peerless, a seedling of the Duchess growing in Rice

County. We have seen the fruit but not the tree, and can not visit it in time to report at the present meeting. Our observations of Russians lead us to believe that out of the many hundreds of varieties being introduced, we may get a score or so that will be hardy enough for the whole region called the Northwest, and we doubt very much if the quality and productiveness of one-half of this number will prove satisfactory to our people, and not more than four or five will fill the bill as long keepers. We have reason to believe that seedlings from these, and especially crosses with our best varieties, will result in giving to our State in the near future an ample list of adapted varieties of the very finest quality. We think it a duty our Society owes to the people, to have their Russians tested as speedily as possible, and disseminate information as fast as obtained, so that our planters may be warned against the planting extensively of such varieties as will prove entirely unsatisfactory. Every possible encouragement should be given to the production of new varieties from seed — for from this source only can we look for the coming apples of Minnesota.

REPORT ON SEEDLING FRUITS.

By A. W. Sias, Rochester.

MR. CHAIRMAN: Mr. Fuller and myself made a visit to the farm of John Robinson, in the township of Viola, on the seventh day of September last. Mr. Robinson is one of Viola's most prosperous farmers, and like the most of our leading agriculturists, has an eye for good fruit. He cultivates many of our most popular varieties of the apple, and has quite a show of ornamental trees. But our object in calling your attention to this particular place was owing to the fact that he was among the first to experiment with the De Soto plum. When they were first introduced into this State he purchased six trees, for which he paid one dollar each, and it proved money well invested. When we saw these trees they were heavily loaded with perfect fruit, and ripe at that time (September 7th). There appeared to be just about the requisite amount of shade, and a rich, loose soil about the trees, making it an excellent place for the pits that yearly dropped about the trees to take root and soon come into bearing. He informed us that a dealer in trees had instructed

him that the De Soto reproduced itself from seed and he had bought many of these young seedlings labeled them DeSoto and sold them. We said to Mr. Robinson that we would be obliged to differ with this "enterprising dealing" as to the fact that they would come the same from the pit. We looked about and found several that he claimed to be from the pits of the De Soto in bearing, but none the same as the original, none as large and fine.

We next visited the orchard of Hon. Wm. Somerville, the leading horticulturist of that section of country, and Mr. Somerville showed us some of the most beautiful apples that our eyes ever beheld; these were new Russians that we propose to designate "Russian Wax," unless we can obtain the true name. That we are not alone in our admiration of this new Russian fruit, many who saw them on exhibition at the last State fair will doubtless bear us witness. Mr. Somerville will, we fear, "run to seed" on Russians, and we don't wonder at it after the experience he has had. He marketed about one hundred and fifty bushels of as fine Duchess as one would wish to see, and many other choice varieties—among them Wealthy, Wabasha, Rollins' Pippin, Elgin Beauty, Gideon's Nos. 5 and 6, Martha, Florence, Brier's Sweet, Sweet Russet, Whitney No. 20, etc., etc. The large variety of beautiful evergreens on these fine grounds are worthy of more than a brief notice. We noticed a singular freak of nature on one of the limbs of his oldest Silver Fir Balsam trees—a fungus some two or three feet in height and about the same in diameter. This fungus is covered with leaves closely resembling the leaves on a yearling balsam in summer, which fall off during the fall or fore part of winter. Mr. Somerville is still of the opinion that the best "insectivorous animal" you can place in an old orchard is the common hog.

Our next objective point was the Brett Seedlings in Dover township. We found Nos. 1 and 2 bearing quite well, No. 3 but few. These trees are too closely shut in by surrounding trees of willow, wild plums, etc., and we noticed that some of the limbs had died since we visited them about a year ago, and from some unknown cause. Since Mr. Brett left the farm, several years ago, it has been rented, and I think the trees have received but little if any care. But your committee are inclined to believe that a new variety that will bear two good crops in succession, following such a test winter as we exper-

ience here three years ago, and that without any care, must have some virtue in them, and be worthy of further trial to say the least.

Your committee next visit the old veteran pomologist, R. L. Cotterell, also of Dover, now considerably past his "threescore years and ten," with a mind still more vigorous than a boy's on horticultural events, where we put up for the night — knowing as we did that there were too many good things to be seen here for men who love fruit and flowers, to pass upon without devoting some little time to study. Mr. Cotterell had a very fair crop of apples for so dry a season. Small fruit fine, especially his grapes. He makes a grand success with the native plum. He also has the most promising sweet chestnut trees that I know of in Minnesota. He has a seedling from the Haas that bore this year, and appears to be more hardy than Haas, but was injured some three years ago; fruit considerably like the parent and keeps about the same. If anyone wishes to know just how to train the Norway Spruce and other tall growing evergreens for yards of limited extent, he can find the best of "object lessons" on Mr. Cotterell's grounds. We also saw here what we never saw elsewhere, viz., a genuine Weeping Balsam. Mr. and Mrs. Cotterell are widely known for their boundless hospitality, and their happy home is not always so easy to get away from, where one's time is limited as in our own case—but we must push on. We next bring up at the farm residence of John Farrier, of Elmira township. The proprietor was not at home, but Mrs. Farrier gave us the "liberty of the orchard." The most conspicuous and attractive feature of the orchard was the Wealthy Apple. We found many of the leading varieties of the State here, doing fairly well, and on the south slope of the hill, but the Wealthy was the acknowledged "boss of all." Whole rows of Wealthy through quite an extensive orchard were literally breaking down with this beautiful fruit, of which Mr. Farrier made an attractive display at the Southern Minnesota Fair. We next bring up at the former residence of our old friend C. H. Greenman, who in 1879 was the honored vice president of the State horticultural society of Wisconsin. Mr. Greenman had left this farm and moved to Chatfield, Minnesota, some years ago, but his "foot prints" still remain there in the shape of a fine Russian orchard (mostly Russians), fine hedges, etc. One of the largest apple trees on this place and doing remarkably well, was the Peach apple. After visiting this place, we felt

our desire increasing to see the man who had left such a good example here, so we went on to Chatfield, and the first call we made was at the home of Mr. Greenman, but as "bad luck" would have it, he was away from home and we did not see him. By permission of Mrs. Greenman, we took a hurried look at his fine place, and found everything in "apple pie order." He is making a specialty of the grape, as usual, of which he has a large and fine assortment. Our next objective point is the Brook Kidron, twenty miles south of Rochester, in Fillmore County. This is the native home of the *Abies Alba*, *Pinus Strobus*, *Abies Balsamea*, *Taxus Canadensis*, and *Juniperus Virginiana*. In a letter read a few days ago from Robt. Douglas, post-marked New York, Dec. 28, 1886, he writes: "The *Abies Alba* is a northern tree, and will grow better and faster with you than further south. I have to-day been examining that tree in company with the superintendent of Central Park. It does very poorly here, as the soil is very dry and very poor. I have seen very fine *Abies Alba* both in the Black Hills and in the Adirondacks, but I think the finest I have seen under cultivation was in the college grounds at Toronto, where I stopped over one day to examine the old planting (over fifty years old) on the college grounds." We think there is no better authority on evergreens in the Northwest than R. Douglas, and that he is right in regard to its doing better here than further south, and if there is a taller specimen on the continent than we found on the little babbling brook Kidron, we have not yet heard from it. This tree is said to be one hundred feet high, but we think it would fall considerably short of that figure. We next call at the Partridge House, in Pleasant Grove, Olmsted County. Here we found the Wealthy again in good bearing condition, as well as Duchess and some other varieties; and lastly at the beautiful stock farm of J. S. Whitney, postmaster at Groesbeck, Olmsted County. Mr. Whitney is a Wisconsin man, and a great lover of fruit, and has started a fine orchard, and as we have good reason to believe, will soon have the best orchard in all that section; but he says he wants no Dayton, Ohio, trees in his. We reach Rochester in time for dinner and take the train soon after, and meet our chairman the same evening, "cheek by jowl" with that old veteran pomologist, Chas. Luedloff, of Carver County. We will let our chairman tell the balance of the story, as our "best man" is none too gifted to show up this fine place as its merits demand.

REPORT ON SEEDLING FRUITS.

By G. W. Fuller, Litchfield.

I spent but a week with the committee, and during this time we found no seedling apples of any value showing any more hardiness than the Wealthy. The trees which bore the apples (Hart's seedlings) which took the premium at the state fair, were in a very bad condition, showing clearly that they are not sufficiently hardy for our use. We found a few Russians both in Olmsted and Carver counties, which looked very promising.

The hardiest seedlings I found are in Meeker County. One is in Cedar Mills, belonging to Mr. Baldwin, and is evidently a seedling of the Gen. Grant, rather larger, of better quality, and of the same season. But the tree is very much better, perfectly hardy, and has never blighted. It is about thirteen years old, and has borne every year since it was three years old. Another seedling is in Greenleaf and is owned by Mr. Mills. It is fifteen years old and has never shown any disease or failure until last season, when a severe wind broke down a part of the tree, revealing rottenness of the heart. The habit of the tree is very much like the Tetofsky, but the apple resembles the Wealthy. From knowledge thus far gained I can not feel very hopeful of success in the line of seedlings. Still we should continue the experiment.

Mr. Cutler. Mr. President, I believe this committee has done as faithful service as we could expect, and I move this same committee be continued the coming year, with the same appropriation for expenses necessarily incurred.

The motion was adopted.

DISCUSSION.

President Elliot. I would like to hear from Mr. Brand as to a seedling apple which he has on exhibition here.

Mr. Brand. I had hoped the committee would make some report as to this variety known as the Peerless.

Mr. Harris. We intend to examine the tree at the first opportunity.

Mr. Brand. This apple was exhibited at the state fair in 1878, at the meeting of this Society two years ago, at the New Orleans Exposition, at the last state fair, but so far no mention

has been made of it that I am aware of. The Peerless is a seedling from the Duchess, grown in Rice County east of the big woods. It was grown by J. G. Miller, who states that he took seeds from the Duchess and planted them. In the same orchard were bearing trees of Talmon Sweet, Winesap, Fall Pippin, Orange, Fameuse, Golden Russet, and a number of other varieties. From the seeds of the Duchess he raised about two hundred trees, of which number some fifteen that were transplanted survived the winter of 1873. I first saw the trees in bearing in 1875. Of those remaining the apple called the Peerless is the best. Two years ago the tree bore nine baskets. I exhibited some of these apples at the State Fair and was given the first premium for the best apple for all purposes. I have it here on exhibition and as to quality it shows for itself.

Mr. McIntosh. I have some seedling apples on exhibition raised from apple seeds obtained at Lincoln, Mass. The tree bears well and it is a winter apple. We have found the Gravenstein to be the best fall apple we have.

Mr. Gideon. I have tried them and found they won't do.

Mr. Kramer spoke of a seedling at Hokah that looked quite promising, supposed to be a seedling of Duchess, but having thicker and larger leaves.

Mr. Stubbs. While on this question I wish to call attention to a seedling tree on the farm of Samuel Liedyard, near the village of Long Lake, a seedling of Wealthy; it has been bearing well for six years. It is of the size of Hyslop and keeps later than any crab I know of. The tree is uninjured, bears every year, and the limbs are loaded to the tip ends, and it seems to be quite valuable for hardiness and keeping qualities.

Mr. Kramer spoke of some seedling trees growing in Allamakee County, Iowa, that appeared to be promising as to hardiness and good bearing qualities.



REPORT ON SEEDLINGS.

By the Jewell Nursery Co., Lake City.

The report from this station is meagre from the fact that but twelve cions were ever officially received; these were top-worked, and unfortunately the stocks were struck with fire-blight and the cions were thus destroyed.

Recognizing the fact, however, that the Minnesota nurseryman could not pin his faith to old varieties, more or less experimenting has been done on our own account, and, we are proud to state, with the most happy results. From prudential reasons, apparent to all, we can not state full particulars as to origin of all our varieties, but will report in a general way.

Dartt's seedling, originated by E. H. S. Dartt, Owatonna, a seedling of the Tetofsky, as a tree is a beautiful, upright and rapid grower. The wood has proved to be remarkably hardy, during this, the most severe season that has ever been experienced in Minnesota. The fruit is nearly the size of the Whitney No. 20, of a deep red color and promises to keep well until February; quite tart; will unquestionably prove a valuable acquisition to the present list of hardy hybrids.

DUCHESS SEEDLING.

This is from a tree now growing in Southwestern Minnesota, and has been in bearing for six years; is an annual bearer, and from the best information obtainable, the seed was from the Duchess, fertilized by Wealthy. The tree stands in a very exposed situation, growing in tough sod, on a dry, gravelly knoll, in a locality that ordinarily has but little snow. In an adjoining orchard are Transcendent, Hyslop, Duchess, Wealthy, Whitney, red and yellow Siberians, and, without exception, the wood of this tree shows less injury from winter than any of the ironclads named. The quality of the fruit is A No. 1, and its natural method of fruiting is to place an apple wherever room can be found to give it support; when thinned out properly the fruit is of the size of the Wealthy and a better keeper; the marking is peculiar, as highly colored as the Duchess or Wealthy, and each apple invariably shows a band of deep crimson, running half around the apple from blossom to stem end, varying from a six-

teenth to a quarter of an inch in width. Our opinion of its value to horticultural interests may be understood when the price we paid for the control of the tree is known—one thousand dollars.

IOWA SEEDLINGS.

In 1885 our attention was called to an orchard of 300 trees, growing in Northern Iowa, not far from the famous Hesper seedling orchard, that gave to the Northwest through our instrumentality, the Hybrids, known as the Minnesota, Beecher's Sweet, Maiden Blush, Conical, etc. Personal investigation made in the time of fruit, in the fall of 1885, showed seventy odd trees in full fruit, and many others not yet bearing. The seeds from which these trees originated were saved in Northern New York in 1861, from selected apples cut for drying, and were planted the following spring. The seedling trees stood in nursery rows in a neglected garden, overrun with weeds and browsed by cattle, until the spring of 1865, when such as had survived the ordeal were transplanted into orchard rows, where many of them are now standing; and all things considered, they are by far the most remarkable collection of natural fruit in the West, many of the trees being from 10 to 15 inches in diameter and from 20 to 30 feet in height, presenting every type of growth that an apple tree could assume.

The site selected for this orchard was extremely unfavorable; the soil a rich, black muck, and so saturated with moisture that the lower edge of the orchard is a springy bog; the slope a sharp, southern exposure; and on the east, north and west is a dense grove of maple and willow, effectually shutting out the free circulation of air, which, of course, renders the orchard very liable to fire-blight; very few of the seedlings show any sign of blight, however.

In the same plat are planted grafted fruits, of many of the ironclads, Duchess, Wealthy, Walbridge, Haas, Transcendent, Whitney and Hyslop, many of which have been struck by blight; all show the effects of the recent severe winters, and yet the best of the seedlings show but little, if any, signs of injury from any cause.

The quality and variety of the fruit is as varied as could well be imagined, being from the size of a Siberian up to a Pound Sweeting; the predominating colors are yellow and pale green, though twelve or fifteen of them are large in size, high in color and very

shapely and beautiful. All seasons are represented in time of ripening, early summer, or harvest, fall, autumn, winter, and some of them last from one season to the next; one variety in particular is a sweet apple, similar in size and shape to the red Astrachan, larger, and a little longer; the boughs have to be propped to support the heavy loads of fruit, annually borne; the fruit is striped, red and white, and is as handsome an apple as could be desired; the quality could not be improved; its season, September; this is one of a dozen equally good for its season and type.

No time was lost in the purchase of the orchard, and we have to-day growing nearly 50,000 grafts from these valuable seedlings and are confident that they will prove to be a veritable bonanza to this region that so vigorously demands ironclads.

The report of the committee on Russian apples being called for the following paper was then read:

REPORT ON RUSSIAN APPLES.

By A. W. Sias, Rochester.

Mr. President and Members:

Two years ago we had a grand test winter and last year a splendid test summer for the new Russians, and found that they behaved better under this frozen and fiery ordeal than any other plants within our knowledge properly belonging under the botanical head of *Pyrus Malus*. Now, there is said to be a reason for everything; so please to bear with your committee while we indulge in a little theory in regard to *why* the Russian trees stood these severe tests better than our American varieties. We view the situation in this way: For many hundreds of years the same severe tests as those above noted have been going on among their millions of seedling and imported varieties, many times no doubt thinning their ranks more severely than with us, but always resulting year after year in "the survival of the fittest," every generation becoming better and better adapted to its cold, arid situation, the sun and drying winds serving to increase the thickness and pubescence of the leaves until after many hundred years they develop a family of trees, which, perhaps, we might be allowed to designate as the Silver-leaved family, with leaves, in

our humble opinion, better constructed to withstand a long, severe drought than even our native wild crab.

The best representative of this hirsute family we believe to be the Autumn Streaked, of which Dr. T. H. Hoskins, Sidney Corp and others speak in highest terms. This we will class as No. 1. The second in this family group, and with leaves almost precisely like No. 1, we place White Russet, of which H. H. Howlett, of Baraboo, writes under date of Nov. 2, 1886:

"In regard to the White Russet I will state I have nine trees of the ten planted in 1875. They were three years old when I set them in the orchard, and I could not ask for a better tree, or fruit; perfectly hardy, early bearer; every year a good crop. Some years a good keeper and others not so good; this year not any of my varieties kept, everything gone November 1st. Some years the White Russet will be in fine condition through March; with me much hardier than Duchess. My best variety in tree and fruit, also in nursery, is White Russet. See Prof. Budd's bulletin for January, 1886, page 21."

Blikanoff Small we class as No. 3. This, like many other Russian names, means nothing, as it is not a small apple, and bears a family resemblance to the Autumn Streaked. We will add no more to this list at present, although there may be others just as good — but we prefer to test them further. In this Silver-leaved family of trees, of which we propose to make a specialty hereafter, we are only copying from nature, as we find it everywhere in the Northwest. More than nine-tenths of our forest trees have thick, silvery, pubescent leaves. We want no more thin, smooth leaves "in ours."

The Autumn Streaked is the most interesting botanical "object lesson" we have yet seen in the shape of an apple tree. The leaves are very large, thick and completely covered with little whitish hairs, which also extend over the current year's growth of wood, completely clothing and shading the newly made cells from the direct rays of the sun, preventing them from drying out too rapidly, and also protecting them from the cold in winter. Another important peculiarity about this variety is, its leaves are of an upright habit, hence the guard cells and breathing pores are more evenly distributed on both sides than in ordinary leaves. The tree is more hardy than the Duchess, but the leaves hang on much later. They fell on our two-year-old trees in November and December, and after they had fallen, the new wood looked as though the leaves had been

cut preparatory to budding, leaving the leaf stock about half an inch long, and leaving the bud nicely protected for winter. The fruit of the Autumn Streaked is nearly if not quite as large as Duchess, a little better in quality, and keeps some two or three weeks longer.

The Russian apple has no truer friend than myself, but please bear in mind that our best friends sometimes indulge in a little friendly criticism, and it is well known to some of you at least, that we have frequently tried to check some of our most enthusiastic admirers of the Russian apple against hoping for too many long keepers from Northern or Central Russia, and we have harped so much on this point, perhaps we had better indulge in a little theory in regard to why these things are so. Charles Gibb—and there is perhaps no better authority—says that at St. Petersburg they have “a cool, short summer.” Others claim—and no doubt truthfully—that in Central Russia the climate is similar to our own; but all will admit that the summer is shorter; and hot weather, or at least excessively hot weather, is shut off there soon after the fruits, such as the *Agis* and *Antonovka*, for instance, are ripe; while here the heat is kept up perhaps two or three weeks longer, or until fermentation sets in, and then the fruit soon decays. Nature had fitted them for a shorter summer than ours. We believe this answers the question why a winter apple in Russia is a fall fruit in Minnesota. And this leads us to advise every fruit grower who possibly can do so, to build an ice house this winter and fill it, and just before these Russians are fairly ripe to pick them, pack carefully and put them in cold storage; in this way we can put ourselves in shape to make the finest display of fruits one year from to-day that was ever made at a winter meeting in the Northwest. We found the Russian apples at Charles Luedloff's and at A. Peterson's, in Carver County, looking just splendid.

Prof. Budd and Chas. Gibb have done signal service to the Northwest by calling special attention to the important fact that we must make a specialty of varieties with thick, pubescent leaves; and while visiting our experimental station in Carver County we had this in view. We found the Autumn Streaked here with a leaf not surpassed, if equaled; we will qualify this a little by saying that this was the way it appeared to us (by the naked eye) but possibly the aid of a good microscope might cause us to give the preference to some other variety.

LEADING VARIETIES.

Six best, as exhibited by A. G. Tuttle of Baraboo, Wis., at our state fair last fall: No. 275, Zolotoreff; No. 177, Green Streaked; No. 288, Raspberry; No. 410, Little Seedling; No. 599, Omensk; No. 277, Wargul.

Six best with me, No. 964, Autumn Streaked; No. 382, Russian Green apple; No. 330, Juicy Streaked; No. 335, Green Transparent; No. 445, Red Cheeked; No. 981, White Russet.

Six best with Wm. Somerville, Duchess, Autumn Streaked, Russian Wax, Charlamoff, Winter O'Porto, Unknown.

No. 978, Golden White, stands high with Dr. Hoskins of Vermont, and from the appearance of the fruit he sent us, should pronounce it a very promising variety.

Mr. Harris suggested that it might be well for the Society to name a list of semi-hardy varieties of apples that may be considered specially dangerous to recommend for planting in large quantities, to be known as a "black list," which was as follows:

BLACK LIST.

Mann apple, Bethel, Walbridge, Haas, Pewaukee, Alexander, Borsdorf, Northern Spy, Salome, Utter's Large Red, Fameuse, Wolf River.

Mr. Harris. I do not believe there is any genuine reliable nursery man in Minnesota or Wisconsin who would sell many of these trees to a customer for planting an orchard. A Wisconsin man might perhaps recommend the Wolf River.

Mr. Pearce inquired as to the Salome.

Mr. Stubbs. It originated in Southern Illinois.

Mr. Sias. I had the Salome but the late hard winter killed the last one. It was recommended by Arthur Bryant, of Illinois, a reliable man, and in that climate might be all right. Those varieties in the list the most hardy are really the most dangerous, and they have been heretofore recommended. The Mann apple has been sold as hardier than Duchess but I have lost the last tree of that variety; they are as tender as Rhode Island Greening, and the Salome is no better. The Fameuse is perhaps the best on the list and if there were no test winters it would answer our purpose. The sooner we adopt such a list the better.

Mr. Pearce said the Mann was doing well in some localities

but ought not to be set generally in the Northwest. Fameuse was hardy also in many localities, but he was not growing it in the nursery.

On motion of Mr. Cutler the "black list," as read, was adopted.

Mr. Harris offered the following, which was adopted.

Resolved, That the press of Minnesota be requested to publish the so-called "black list" and to warn the people from purchasing trees from every unknown tree agent.

OUR SEEDLING AND RUSSIAN APPLES.

REPORT OF THE SUPERINTENDENT OF THE STATE EXPERIMENTAL FRUIT FARM.

By Peter M. Gideon, Excelsior.

It is with pleasure that I comply with your request to give my views on Russian and seedling apples. The seedling has been my hobby for the last sixteen years, and the success attained gives me hope that not far in the future the cold Northwest will be one of the leading apple-growing districts of North America.

Twenty-three years ago I planted a few Cherry crab seeds, obtained of Albert Emerson, Bangor, Maine, and from those seeds I grew the Wealthy apple; in seven years it fruited, and that fruit convinced me that the true road to success was in crossing the Siberian crab with the common apple, and on that line I have operated ever since, with results surpassing my most sanguine anticipations. I did not suppose that in the short space of sixteen years, the time since the Wealthy first fruited, that I should have more than twenty first-class apples — as good as the world can produce — in succession from the first of August to March, and in hardiness of tree surpassing all known varieties of the common large apple. But it is done, and in the doing the problem is solved as to what to do and how to do it, with the material at hand with which to attain yet greater results. At the outset it was test and try; but now that the problem is solved it is onward, with great results certain.

When I say we have twenty first-class apples, that does not include all that are worthy of cultivation by any means. And now, with such results, and only a few thousand trees fruited at the end of sixteen years, what may we not expect at the end of

the next sixteen years, with 20,000 or 30,000 choice, selected trees from the very best of seed, which are not yet fruited, and the seed of over one hundred bushels of choice apples planted this fall, all to fruit in a few years! Then on, on, planting the seed of the best each year, soon the choice varieties will count into the hundreds, and the great Northwest will be the fruit-paradise of America.

To get the desired cross we plant the selected varieties in close proximity, so that the natural fall of pollen will the more surely do the desired fertilizing, and the seed thus produced being planted, the most promising of the seedlings selected and set in orchards for fruiting, and, after fruiting, the best in tree and fruit being selected from which to grow seeds to try again, and so on, at each repetition I find there is a gain. The young trees that fruited this year for the first gave a larger percentage of first-class apples than any lot ever fruited before.

By crossing and judicious selection we retain the hardiness of the crab in the tree without the crab thorns, and on top grow large apples without the astringency of the parent crab. And yet, by the commingling of the two natures, we get an exquisite flavor not found in any other class of apples, especially so when made into sauce. But our triumph is not yet complete; we must, we can, fill up the balance of the year with a continued succession of luscious apples. There is no question as to the certainty of such a result; the past is a guarantee that it can be done.

But the proper cross can't be got in Minnesota; a fact clearly demonstrated in the extensive and expensive trials that have been made in the last nine years in the State orchard. And here let me state that the seedling is inclined to ripen its fruit at or near the time the parent apple did from which the seed was taken, hence the need of seed from long keepers to grow the same. There are no long keepers, of the best quality, yet found that are hardy enough to fruit in Minnesota; but we can take our best hardy seedlings further south, where the long keepers can be grown, and there get the cross and then bring the seed here to grow and test the hardiness of tree and quality of fruit. We want first-class apples, and to get them we must use first-class parentage. And even then scullions will be numerous, from the fact that all varieties of apples are mongrels of many degrees of crossing, and the various relations will crop out in a multitude of forms. But past success is a guarantee for the future that out of the many some will be good. Our seedlings will average in

quality with Hyslop and Transcendent; but those of first-class, such as we propagate, stand about as one to five hundred, as hardy as Duchess and Wealthy, and of the extreme hardiest about one to fifteen hundred.

SEEDLING TREES FOR DISTRIBUTION.

Two years ago this winter was the first time the Duchess and Wealthy were seriously hurt, and a like fate befell all the Russians on our grounds, so that not a Russian set an apple on our grounds last year, whilst alongside of them our seedlings carried a fair crop, some of them profuse, and this year all bore heavy crops; showing beyond a question that the crab infusion is to be the foundation of successful fruit culture in the Northwest. The State orchard yielded about one hundred bushels of apples this year, all of which being of our own seedlings; all else of value failed two years ago this winter. This fall we planted the seed of over one hundred bushels of choice apples, to grow trees for trial purposes. We now have thousands of choice trees on hand for distribution to those who want one, two, three and four year old trees from seed. Those who come and dig the trees will get them free of cost; others will have the cost of digging and packing to pay. And, unless otherwise instructed, will ship free of cost, except as above stated, to anyone in the Northwest who may so order. The great bulk of the trees are two years old. The cost of digging, boxing or bundling would be about one dollar per hundred. All who get trees will be expected to take good care of them until they fruit, and if any prove of extra value, so report, but the trees and the profits thereof belong to the cultivator. We only ask the report that we can note the progress. The trees which produce poor fruit can be top-grafted with any good variety that the owner may select, and thus make permanent trees of value. Those who want large trees had better come and do their own digging and thus save a large bill; the trees are large for their age and a more promising lot of seedlings I never saw.

PLANT VARIOUS KINDS.

Though we have a good collection of hardies, and in succession from the first of August till March, yet I would not discourage the planting of Duchess, Wealthy, and some of the best of the Russians. Their value is too great to be rejected on account of

one partial failure, after over twenty years of uninterrupted success; for such a winter as that of two years ago may not occur again in a lifetime, if ever. If those varieties should stand only ten years, they would be the most profitable crop a land owner could plant. Therefore I advise to mix them in with our extra hardies, especially if you have a clay soil, for in such they do best. A north, northwest or northeast exposure is the best for the apple, and, indeed, for any fruit except the grape; give them all the sunshine you can.

While on the subject of apple culture, let me state a few facts in regard to root grafts. The so-called crab roots are not all hardy—none are pure crab, all are mongrels—and where the crab predominates the graft that is not a crab mongrel does not take well, neither on root nor stock. The mongrel root and mongrel stock are only preferable when a mongrel graft is to be inserted, but as all such are not hardy, a good mulch is needed of some coarse litter to make sure against root-killing under certain conditions, as not all winters will kill even the most tender roots.

The common apple will not make a smooth junction on a stock where the crab predominates, and consequently will not make a lasting tree; and a hardy variety grafted or budded on the common apple stock is worthless, as the stock below the junction of graft or bud is sure to winter-kill the first hard winter. You can protect a tender root, but you can not save a tender stock, so avoid the tree agent with his budded trees.

NURSERY FRAUDS.

And, lastly, it matters not where a tree is grown—whether east, south or north—that tree is best that comes to the planter in the best condition, if true to name, but with the great mass of tree planters, the smooth-tongued agent with his rubbish and frauds is the one thing needful. Though fleeced a score of times, they patronize him the twenty-first time as freely as ever, and the bigger the price of the fraud the more greedily they swallow the bait. The fact is notorious that tree agents have sold one hundred trees of the Gideon apple, at one dollar per tree, where I, the originator, have been able to sell one at twenty-five cents. They have been swindled so often, and paid so dear for it, that they have come to love to have it so. They are wedded to the agent; it is love's union, and dead trees, plants and grape vines can not separate them.

DISCUSSION.

President Elliot. I would like to call attention to one matter referred to in the paper, the distribution of trees. I do not know that the way proposed is the best for the interests of the people of the State. If these experiments are worth anything they are worth carrying forward to the end. If trees are distributed in the manner suggested, from seventy-five to ninety per cent of them will never be heard from. Would it not be better to send trees out after they have been fruited? It seems to me that would be a surer plan for obtaining hardy trees for Minnesota.

Mr. Harris. I understand Mr. Gideon has more of these trees than he can take care of, and he wishes others to assist in carrying on these experiments. It might not be well to send them out broadcast, but it would be well to supply experimental stations that would make reports from time to time.

Mr. Gideon stated he had asked advice of the regents of the State University as to this matter of distributing trees and not having received any had concluded to try the proposed plan. About a hundred applications had already been sent in, a good many of which were from Dakota.

Mr. Dartt thought probably very few of these trees would prove to be hardy. It might be better to test the trees thoroughly before sending them out, so there would be at least an even chance for success.

Mr. Gideon said all the tender stock had been removed from his grounds, and he had something like 20,000 trees left that he was sure would stand the greatest extremes. The majority would not bear first-class fruit but there were few of them that would not produce fruit equal to the Hyslop or Transcendent. The trees could be top-worked to advantage. There were but few experiment stations, and to keep them where they are would be expensive. It had cost him one hundred and fifty dollars a year ago to guard the State orchard, and it was useless to plant a seedling orchard on his grounds and expect to get fruit, as people would pull them before they were ripe. Trees would have to be tested as to quality of fruit produced elsewhere. He thought the best plan the one he had proposed, although he did not control the matter. If it was thought best not to distribute the trees in that way he would fill the orders received from his own trees.

Mr. Pearce did not know of any better plan than the one suggested and thought the trees would prove entirely hardy, and was in entire sympathy with the plan.

Mr. Cutler thought the number of trees sent out should be limited.

Mr. Gideon. The number is limited to one hundred.

Mr. Sias approved the plan of Mr. Gideon for distributing the new seedlings, and thought the experiment stations should assist also. That was what they were for and he knew of no place to obtain trees more worthy of a fair trial. The test winters had helped to cull out tender varieties. If one in a hundred proved to be hardy it would prove a valuable acquisition.

Mr. Brand thought the best way to find out whether these trees were worth anything was to put them in the hands of persons who would take care of them.

President Elliot. We have sixteen experiment stations.

Mr. Dartt. Mr. President, I have had a good deal of experience with seedlings. I have raised a large number of crab seedlings and not one of the lot has proved of any value. They made pretty trees but the large majority blighted. There is no objection to sending out these trees for experiment if it is understood that probably not more than one in a thousand will be of any value. The more one takes the worse he will be off, and the effect is likely to be discouraging to the fruit interests of the State.

Col. Stevens. Mr. President, I do hope this project of Mr. Gideon's for the distribution of those seedling trees will be approved, and that we shall not be frightened by Mr. Dartt's melancholy ways. I have visited his orchard and I found he was very successful in growing good apples, and if he can grow them why can not others? It looks to me as though the proposition of Mr. Gideon was most desirable and the most feasible method for placing these trees in the hands of the people. I have no doubt many of them will prove valuable. Mr. Gideon has some forty or fifty kinds besides the Wealthy, none of them much inferior to that variety and many of them are superior.

Mr. Dartt. I do not desire to discourage but to advance fruit growing; and I only wish to refer to the "whistling" of these gentlemen last winter to keep their courage up at the meeting.

Mr. Pearce thought if one tree in fifty proved valuable it was worth more than all the expense required, and hoped no one would throw cold water on this scheme. He would advise every

farmer in the State to send to Peter M. Gideon for a hundred of these trees, to put them out and in a short time the apple question would be solved.

Mr. Harris said one of the best seedlings he had found was the so-called "Okabena," at Worthington, which was grown from seed obtained of Mr. Gideon. It was planted in 1871 and had borne several crops of fruit. It was a fall variety, but if the fruit would keep till March it would be worth \$2,000,000 to the State.

Mr. Dartt. That is the kind of tree to send out.

Mr. Pearce had seen another of these seedlings that was a hundred per cent better than Transcendent and which would in a few years come into market.

President Elliot. We are gratified to have this discussion come up because there are some that are doubtful as to whether these experiments are of any value. But I think facts have been developed which will warrant carrying along these experiments. I hope whatever may be done with the fruit farm that the experiments begun under the guidance of Mr. Gideon will be carried on to final success. I hope it will be but a short time until we shall have by this natural process of hybridization varieties worthy of cultivation in many if not in all localities of the State. We should select and plant the best seeds and continue to experiment until we develop something that will be worthy of our State.

Capt. Blakeley. The great interest of the State in growing fruit is manifest to all. All legitimate agencies should be used to encourage the industry. The project to have a station for the purpose of growing fruit is one that the public should appreciate and these stations should be perpetuated; the wisdom of which can not be questioned. The State and the country generally is to be benefited and there should be someone who has time and the requisite knowledge who should be employed in this work and he should be paid by the general public. The general public are abundantly able to do that. The results will certainly be beneficial to the State. We should realize that this must to some extent be a continued effort. It is well known that in nearly all nations except the United States there is some effort made of this kind for the encouragement of the production of plants, forests and fruits; and we have not yet risen to the intelligence that some of the older countries exhibit in this respect. The government should encourage the planting of trees. I had some experience in early days in bringing trees to this country by the

boat load; and I generally insisted on getting the freight before we started. My idea was the trees would not live in this country; that was over twenty years ago. Thousands of trees were sent out here from New York state, and I presume very few of them are yet alive. In order to succeed in this work there must be persistent effort.

Mr. D. Day. Mr. President, I wish to say that I approve the course Mr. Gideon has taken in regard to sending out trees, and I would like to try some of them myself, and some of my neighbors also. I think if farmers would take care of their trees they would succeed; they need care as well as anything else. Trees will grow with proper care.

Mr. Cutler moved as the sense of the Society that the proposed plan of Mr. Gideon, for the distribution of seedling trees, be approved, which motion was adopted.

Mr. Gilpatrick said much depended upon the cultivation of trees as to whether one would succeed. These experiment stations should report as to their manner of culture. He favored deep planting as a protection from winter killing.

Mr. Brand. In the orchard where the Peerless stands the Wealthy in 1884 and before that had borne a bushel and a half to a tree, but a good many of the trees were killed a year ago last winter.

QUESTION BOX.

The question box being called for the following was read: "Does any member know where the nurseries of L. L. May & Co. are located? They are doing business in Iowa selling fruit trees and other stock leaving cards with address 'L. L. May & Co., Nurserymen, St. Paul, Minn.'"

Mrs. Stager, of Sauk Rapids. Mr. President, I came down here to speak about that same thing. Last year and the year before there were agents through there selling fruit trees and different kinds of plants at high prices, and some of my neighbors bought of them and found the stock to be almost worthless; and the agents told them they had a farm near St. Paul where they raised their stuff. They could hardly get rid of these agents. Last year they brought around Sharpless strawberries and the agent wanted to sell me some of them. I told him I didn't want any; he said he would send me fifty and they came. A good many had signed for things; and instead of sending to the agent they sent to a lawyer there and he made every one take what he had signed for except myself, and the most of them

paid from ten to fifteen dollars; and I was requested to speak about that agent here.

Mr. Cutler said that a man named Jordan had been through his county stating that he was representing May & Co., of St. Paul; that they had a fruit farm of some 160 acres there near the city; he was making a specialty of tree gooseberries, a thornless blackberry and the Gideon apple. Mr. Gideon had represented this firm as a "fraud" in plain words. This agent had photographs of the tree gooseberry with fruit larger in size than a silver half-dollar; said the trees grew about six feet high and the berries had no thorns on them; as to the Gideon apple he stated that Mr. May had purchased the original tree for \$200. As Mr. Gideon was present he could answer for himself as to that transaction. I said to him, "Mr. Gideon is advertising that stock; how did he get it?" His reply was that he supposed he propagated it the same way he had the first one—raised it from the seed. Of course I did not bite at his bait but some of my neighbors did—gave him a small order to get rid of him.

Mr. Gideon. Mr. president, to give a little history. I sold to Chase Bros., of Rochester, N. Y., some stock and I was not to propagate until they got a stock on hand and then they were to let me know; when they had sufficient stock they were to notify me that I could go ahead with it, which they did and I have been propagating it since. I never have sold to May & Co., a tree, vine or plant, in any shape or form; I never got a cion or bud from them; I have had no dealings with them whatever. Their claim that they got the tree of me and had entire control of it (I have their circulars at home but I forgot to bring them out) was entirely false, not a word of truth in it. I have been told that their agents are selling trees in Iowa at enormous prices, claiming that they have entire control of my seedings of various kinds. I have published them in various papers in Minnesota and Iowa. When I first published them in the *Farm, Stock and Home* they wrote to me giving me six days to retract and make it as public as what I had said in exposing them. I told them they could drive ahead as quick as they pleased, I had nothing to take back; that is the last I have heard from them. One editor wrote me they had threatened to sue him, and I wrote back telling him to let them drive ahead, I would be on hand to foot the bill; that I could prove him a fraud, and told him to publish that in his paper over my signature.

On motion of Col. Stevens the meeting adjourned till 2 o'clock P. M.

MINNESOTA STATE AMBER CANE ASSOCIATION.

TENTH ANNUAL SESSION,

HELD AT ST. PAUL, WEDNESDAY, JAN. 19, 1887.

The tenth annual session of the Minnesota State Amber Cane Association was held at the capitol, St. Paul, on Wednesday afternoon, Jan. 19, 1887.

The Association met at 2 o'clock P. M., and was called to order by the president, Capt. Blakeley.

The minutes of preceding meeting were read and approved.

FINANCIAL REPORT.

After the reception of members, payment of annual dues, etc., the following report was presented :

ST. PAUL, MINN., Jan., 19, 1887.

To the officers and members of the Minnesota Amber Cane Association,

GENTLEMEN: I have the honor to present my annual report as secretary and treasurer of your Association :

TREASURER, DR.

To amount on hand, as per report of Jan. 22, 1886.....	\$55 30
To membership fees received during year 1886.....	8 00
	<hr/>
	\$63 30

TREASURER, CR.

By amount paid printing.....	\$6 25
By postage and stationery.....	2 75
	<hr/>
	\$9 00
Balance in treasury.....	\$54 30

Respectfully submitted,

EDWARD D. PORTER,

Secretary and Treasurer Minnesota Amber Cane Association.

On motion the report was accepted and approved.

ELECTION OF OFFICERS.

The Association proceeded to the annual election of officers for the ensuing year with the following result:

President—Russell Blakeley, St. Paul.

Vice President—Ditus Day, Farmington.

Secretary and Treasurer—Edward D. Porter, State University.

Executive Committee—Russell Blakeley, Ditus Day, Edward D. Porter, Seth H. Kenney, J. F. Porter.

The president appointed as a committee on samples Messrs. Smith, Stubbs and Busse.

Mr. Elliot called attention to the matter of exhibits at the state fair. Last year sugars, pickles, preserves, etc., were placed under the charge of the State Horticultural Society. He suggested that some one be appointed to look after the amber cane interest.

On motion, Prof. Porter was named as a committee of one to take charge of the amber cane exhibits at state fair.

Prof. Porter called attention to the importance of having something arranged in advance for making a creditable exhibit. He urged the importance of making preparations at once by selecting samples of syrups, sugars, etc., for exhibit and display at the state fair, and not leave the matter until a few days before the fair opens, when it will be too late to accomplish anything.

COMMUNICATIONS.

The secretary read the following communication :

U. S. DEPARTMENT OF AGRICULTURE, }
COMMISSIONER'S OFFICE,
WASHINGTON, D. C., Jan. 5, 1887. }

Edward D. Porter, Secretary, etc., St. Anthony Park, Minn.,

MY DEAR SIR: Your kind letter of December 6th only came to my desk a few days ago, and since then I have given it careful consideration. My inclination is strongly in favor of an acceptance of your invitation; but my public duties at this stage of a short session of Congress are pressing, and can not be omitted even for a few days. I should be again happy to meet and greet the members of your joint convention; but I shall have to forego the pleasure.

Very respectfully,

NORMAN J. COLMAN,
Commissioner of Agriculture.

The following communication was then read :

LETTER FROM INDIANA.

To Russell Blakeley, President Minnesota State Amber Cane Association, St. Paul, Minn.,

DEAR SIR: Not being able, as I had intended, to be with you in convention, I take this method of wishing your Association, in convention assembled, a prosperous and profitable session; and wishing to assist the good cause all I can, I tender the Association the free use of the columns of the *Sorghum Growers' Guide* in any way that will advance the interests of the sorghum industry, for which we labor. You will notice by papers which I send the Association, that the Indiana cane growers, at their recent convention, adopted resolutions against glucose adulteration, and also asking a government appropriation of \$10,000 for experiments in the interest of small sorghum manufacturers. We would take the liberty of suggesting the same course to your Association, as in the interest of the common cause. Inviting you all to attend the next annual convention of the Indiana Cane Growers Association, I am,

Respectfully,

A. S. CHAPMAN.

President Indiana Cane Growers Association.

RESOLUTIONS ADOPTED BY THE INDIANA CANE GROWERS
ASSOCIATION AT INDIANAPOLIS, IND., DEC. 31. 1886.

Whereas—The manufacture of sorghum molasses in this country is conducted mainly by farmers scattered throughout our whole corn belt, employing an average individual capital of \$1,000 and aggregating in value several hundred thousand dollars, producing annually a pure, wholesome molasses valued at many millions.

Owing to the adulteration, mixing and compounding of all commercial syrups as practiced in our cities, we can not by our present methods of manufacture produce an article sufficiently low in cost and uniform in grade for successful competition, owing to our isolated condition, other interests in which most are engaged and the lack of means, no considerable effort has been made to develop the industry, our advance therefore during the past twenty-five years has not kept pace with the improvement in other lines of manufacture.

From these causes the industry is in a depressed condition, many plants were not operated the past season and more will dismantle the coming season.

Recent developments have disclosed two processes for cleaning the cane and purifying the juice that give promise of inestimable value to the manufacturer of sorghum sugar and molasses, we therefore feel the urgent necessity of extended experiments to determine the value of these and other processes, hoping to restore again the prosperous condition prevailing upon the advent of these spurious syrups on the market.

Be it resolved therefore : That our National Congress be urged to appropriate the sum of \$10,000 to be expended under the direction of the commissioner of agriculture for the exclusive benefit of the sorghum syrup manufacturers of this country.

(Signed) A. S. CHAPMAN,
A. C. PORTER,
E. W. DEMING,
W. F. LEITZMAN,
Commissioners.

GLUCOSE ADULTERATIONS.

Resolved—That this Association of Indiana Cane Growers in convention assembled this thirty-first day of December, 1886, do hereby petition the National Congress to consider the fraudulent adulteration of the sweet products of the country with glucose, and to pass laws prohibiting such adulteration compelling manufacturers and those who handle glucose to represent it as glucose, and making the adulteration of any sweet article by glucose a misdemeanor;

Resolved—That our senators and representatives be requested to see these, our wishes, properly brought before the National Congress.

On motion, the above resolutions were approved and the secretary was directed to correspond with the Indiana Cane Growers Association, and express our sympathy with them in their efforts to drive adulterated sugar products out of the market.

Prof. Porter referred to the action taken last year by the Louisiana Sugar Growers Association to procure legislation prohibiting the adulteration of syrups by glucose, to the subsequent calling for contributions to enforce the law. It was recognized to be the fact that adulterations had been carried to such an ex-

tent that the southern cane industry was being destroyed. The standard of New Orleans syrups had been lowered and it was next to impossible to obtain a gallon of those goods known to be pure.

The President's annual address was then read.

PRESIDENT'S ANNUAL ADDRESS.

Gentlemen of the Minnesota Amber Cane Association :

In accordance with our rules in the past, it becomes my duty to present to you at this time a review of our work for the year and to compare it with results in the past, and, if practicable, to make some suggestions for our consideration and endeavor to add to the sum of our practical knowledge in relation to our industry.

The amount of work done in this State, has not been as extensive as could have been hoped, although the prices for our syrup are sufficient to make the business reasonably profitable. I regret to say that four and one-half cents per pound for sugar is anything but encouraging to the progress of the business for the future and may be regarded as an explanation for the demoralized condition of our business throughout the country, north and south, in fact the world over, for there is no doubt that this is about the darkest outlook ever presented to those who have capital invested in growing and manufacturing sugar, that history presents.

The season has been more than usually favorable for the growth and harvest of our crop, but we have a new experience to record in relation to a calamity that may possibly overtake our crop before it shall be ready for the harvest. I learn that quite a large amount of cane has been destroyed by the chinch bug. This is the first time that I have heard of this additional hindrance to the success of our labors and, while I do not think that we had any good reason to expect that we should escape this scourge when it came, still, we seriously regret to be obliged to record the fact.

I am not able to report anything in the nature of critical investigation within the State. I will proceed to state some of the conclusions that have been arrived at in relation to the future success of our labors in the production of sugar from sorghum.

Prof. H. W. Wiley, when he finished his work at Ottawa,

Kansas, closed his report (see bulletin No. 6, page 19), with the following

GENERAL CONCLUSIONS.

The general results of the experiments may be summarized as follows:

First—By the process of diffusion, ninety-eight per cent of the sugar in the cane was extracted, and the yield was fully double that obtained in the ordinary way.

Second—The difficulties to be overcome in the application of diffusion are wholly mechanical. With apparatus on hand the following changes are necessary in order to be able to work one hundred and twenty tons per day. (a) The diffusion cells should be made twice as large as they now are, that is, of one hundred and thirty cubic feet capacity. (b) The opening, through which the chips are discharged, should be made, as nearly as possible, of the same area as the horizontal cross section of the cell.

(c) The forced feed of the cutter requires a few minor changes in order to prevent choking. (d) The apparatus for delivering chips to the cells should be remodeled so as to dispense with the labor of one man.

Third—The process of carbonation for the purification of the juice is the only method which will give a limpid juice with the minimum of waste and a maximum of purity.

Fourth—By a proper combination of diffusion and carbonation, the experiments have demonstrated that fully ninety-five per cent of the sugar in the cane can be placed on the market either as dry sugar or molasses.

Fifth—It is highly important that the department complete the experiments, so successfully inaugurated, by making the changes in the machinery mentioned above, and by the erection of a complete carbonation outfit.

I believe that this season's work was closed by a public dinner, given to Prof. Wiley, at which some rather complimentary toasts and speeches were given and made in honor of the final success of the work of the department as conducted by the professor.

This was thought to be the final end of the experiment, and the department asked and received an appropriation of \$94,000 to erect proper machinery as advised by Prof. Wiley, which was erected at Fort Scott, Kansas, this season. Commenced

work September 13th, and worked, through the diffusion, during the season, 2,322 tons of cane.

I have not the patience to give you the details of this season's work, or to do more than refer to the conclusion to which he finally came, at the close of the season, and I think that all that is necessary to quote is the first paragraph of his conclusions, which is in the following words, found on page 41, bulletin No. 14.

"In a general review of the work, the most important point suggested is the absolute failure of the experiments to demonstrate the commercial practicability of manufacturing sugar from sorghum." I will, however, still make one more quotation which may be found in the closing of his report, at the bottom of page 44. He says: "I consider that my connection with the department of this industry has ended." I am compelled to say that I am truly gratified that this is the last that we are to hear of him in this connection. This is a most mortifying conclusion of the last eight years' work of the agricultural department, and the more so for the reason that it is so entirely unnecessary and false.

Sugar has been made from sorghum for the last six years, and everybody acquainted with the history of the business during that time knows it. The only difficulty connected with the business is the unprecedented low price of sugar and syrup, not only in this country but the world over. But let him pass.

I now turn to a more pleasant aspect of this subject and will refer, as I have upon former occasions, to the only practical and intelligent efforts in connection with this investigation. I refer to the Rio Grande Works in New Jersey, operated by Geo. C. Potts & Co., of Philadelphia, and under the management of Henry A. Hughes, superintendent, and Prof. A. L. Neale, chemist of the agricultural experimental station of New Jersey.

The Rio Grande Works has been in operation since the season of 1882 and have been in the hands of experienced sugar men, since they were first started, and have been faithfully operated with the purpose of making them a paying business. They have also had the support of the state, by a bounty for cane and sugar, until this year, but the price of sugar has continued to drop from seven and one-half cents per pound for fair refining to four and one-half cents per pound at the present time; but against all the most unfavorable circumstances possible they have continued to fight with an indomitable courage, determined that they would succeed.

I have now before me the New Jersey Agricultural Experimental Station Bulletin, No. 41, for the year 1886, which gives the result of the work of the Rio Grande Works for this season.

I should be pleased to give a summary of this report but it would make this paper too long and I must content myself with making a few references to its contents. On page 4 they say that 89 per cent of the total sugar in the cane was obtained by diffusion and only 48 per cent of the sugar in the cane was secured by milling. Mill products must therefore be increased by 84 per cent to equal diffusion products. The following is a description of the process of preparing the cane for the diffusers: "The bundles of sorghum, each weighing about three hundred pounds, are raised, by steam power, to a platform, upon which they are opened."

From this platform the cane is arranged in a bed five feet wide, and is conveyed by carriers, butt end forward, to a heavy revolving knife. The feed is so regulated that at each revolution this knife cuts off four inches of the cane bed until the seed tops are reached. By a very ingenious arrangement these seed tops escape the knife by dropping through a trap door which is turned by hand at the proper moment. This separation of the seed tops from the unstripped cane has been found to be thoroughly satisfactory. The four-inch sections of cane, mixed with leaves but practically free from seed, are elevated to a fan which blows away much of the leaf, and, under favorable conditions, wastes very little or none of the stalk. Two small knives, each revolving nearly 2,000 times per minute, next shave these cleaned sections into chips, and the cane is ready for diffusion.

I should be pleased to give a description of the process of diffusion as practiced at these works, but it does not differ from any other very much and would not prove especially interesting.

This process of preparing the cane for the diffusers reduces the weight of the unstripped and untopped cane twenty-one per cent, leaving 1,576 pounds of clean cane. It is suggested that the cane should be cut into two-inch lengths before going to the fan and that two fans should be employed instead of one to make the clearing of the cane of leaves perfect, and it is especially desirable as the leaves contain a large amount of solids that prevent crystallization of the sugar. Small portions of the stripped, topped and shredded cane were picked from the carrier during the time occupied in filling the diffusers. About fifty pounds were secured in this manner, from which a sample was drawn.

This was dried at 120° Fahrenheit, ground to a flour and extracted with boiling alcohol.

The alcoholic extract, properly purified and polarized, indicated that one ton of unstripped and untopped cane contained one hundred and twenty pounds of 100 test sugar.

For practical purposes it is therefore safe to assume that the entire lot of 728 tons of cane used in the diffusion trial averaged not less than 114 pounds of 100 test sugar per ton. Of this 114 pounds the diffusors secured 79.9 pounds. The diffusion bagasse and the waste water from the battery must have contained at least 34.1 pounds, or 30 per cent of the sugar produced in the field. It was ascertained that the bagasse and water did contain this lost sugar, and it was caused by the bagasse not being cut in a uniform manner or size, and the work of the diffusors not being as complete as it should have been.

It would be a great gratification to be able to give you still further quotations from this very valuable and carefully prepared report, but I will not trespass and will close my reference to this report by stating the opinion of these gentlemen.

In regard to this industry, after their close attention and painstaking care, during the last five years' work at this place, where many hundred thousand pounds of sugar and a very large amount of molasses have been made by them, this report says:

"Both Superintendent Hughes and the chemist of this station believe that the sorghum sugar business can be made profitable and claim that the correctness of this opinion can be demonstrated by a house equipped to work fifteen tons of cane daily, and the amount of money necessary to build and equip it will not exceed \$5,000."

I do not feel willing to extend this address by quoting from the report of Prof. Stubbs, of the Louisiana Experimental Station, except to say that he reports that the cane grown on the station was very promising in the quantity of sugar it indicated, was very good, and the quantity of cane grown to the acre very promising.

I will make some reference to the statistics of the sugar production for the year 1886-7.

The amount of beet sugar produced in Europe as reported by Licht's monthly statement is 2,620,000 tons. The amount of cane sugar will probably reach 2,500,000 tons more and probably the aggregate is larger than ever reported before. Willett, Hamlin & Co., of New York, estimate the consumption of the

United States for ten months at 1,134,269 tons, or about 1,360,000 tons for the year which, at 5 cent per pound, or \$100 per ton, will equal \$136,000,000; and the increase continues at the rate of 100,000 tons per annum, to which the import of molasses should be added.

The increased consumption of our people demands that a supply shall be furnished by ourselves, and I still believe that it will.

The following paper was then read :

THE AMBER CANE INDUSTRY.

By Seth H. Kenney, Morristown.

To the President and Members of the Minnesota Amber Cane Association :

I am reminded that this is the tenth year of our existence as a state organization; one-half the age of the State Horticultural Society. By comparing the samples of crude sugar and syrup presented to the St. Paul Chamber of Commerce ten years ago, to the samples presented to-day by members of this society, it will be seen that a very great advance has been made. As members of this Association, we invite the members of the House of Representatives and Senate and everyone present that is interested to test the samples we have presented. When we remember the state of Minnesota received first and second premiums on amber cane sugar and syrups at the world's fair at New Orleans for 1884-5 over the entire United States, we may congratulate each other for the progress we have made in producing products that commanded the attention of the New Orleans Sugar Exchange and their cordial invitation of the executive officers of this Association to be present at their meeting. As superintendent of the Minnesota exhibit of amber cane products at New Orleans, I heard many remarks complimentary to this State. Mr. John Diamond, vice president of the New Orleans Sugar Exchange, said to Mr. Kenney: "I wish to congratulate you for the fine exhibit of sugar and syrup produced by your State, also the quality of the exhibit." Another sugar planter, addressing his friend, said: "Only think of it, that 2,000 miles up the Mississippi they can produce such goods."

In the last two or three years there has been as much improvement in the manufacture of amber cane products as there has been in the new process making flour. This invention was brought out by a practical worker of our Association, Mr. John F. Porter, of Red Wing, Minn. It has, in my opinion, reduced the operation of sugar making in the North to a decided success.

I manufactured on one of Mr. Porter's copper evaporators the past season more than 6,000 gallons of heavy syrup, weighing from 11½ pounds to 12 pounds per gallon. In the manufacture of this crop there were days when a well-defined sugar grain formed in the syrup before it was fairly cold. This evaporator is constructed to boil by steam, and so fast, that no inversion of the sugar takes place, providing suitable cooling facilities are furnished after syrup is finished. Syrup that will weigh 11½ pounds per gallon at the point that we finish it contains about 236 degrees of heat, and tests by the saccharometer while hot about 36 degrees, a heat sufficient to melt solder. The rapid work which I was able to do, with several gentlemen to time the amount of syrup per minute, the evaporator produced one gallon per minute of thick syrup; the amount of juice to produce 1 gallon syrup was 7 gallons per minute; the juice averaged 8 degrees saccharometer. I have seen it as high as 11 degrees and not uncommonly 9 degrees. One degree after you go above 8 degrees is more in making sugar than the first 5 degrees. The past season in Minnesota, though producing juice of fine quality, for some reason the saccharine strength was not as great as most other years. I have found that cane blown down before fully matured never attains full saccharine strength.

I have also found that a heavy rain on the cane after it is ripe somewhat reduces the saccharine strength. I have been informed that the cane grown for the government works at Fort Scott, Kansas, had much of it taken on a second growth. In my experience nothing is more detrimental to success in sugar making than this. I received a sample of sugar from the works at Fort Scott. It was a credit to those having charge of the works. There are several reasons why the amber cane industry is not making more progress in the Northern states. Glucose is as much a detriment to the amber cane interest in the North as oleomargarine is to the butter interest. If we had a law and a state inspector to test the syrup, and confiscate the products that are sold as "Tennessee Sorghum," that are mixed with from one-half to three-fourths glucose, there would then be a

better demand for home-made syrup. The wholesale price of syrups has ruled very low for several years, because a pure product has to compete with those made with a cheaper material. I am not finding fault about prices. I have sold the largest part of my last crop at forty-five cents, by the barrel, and fifty cents per gallon by the keg. At these figures I can live myself, and am able to hold my customers. But every citizen, loyal to the state of Minnesota, would be glad to see, in the days when wheat growing is not remunerative, another industry that instead of sending money to other states for cane syrup, the farmers of Minnesota could find a home market where they could exchange their pure goods for such products as they may need.

I would not advise large outlays in machinery without some previous knowledge. There are several successful works connected with this Association that have made it a financial success. Mr. O. S. Powell, of River Falls, Wis., Mr. John F. Porter, of Red Wing, and my own works at Morristown, Minn., each factory producing several thousand dollars worth each year. I worked up the cane the past season for forty-eight farmers; the average for each one was forty-two gallons each; the price paid was twenty cents per gallon for making. Nearly everyone has a good share of his product in sugar. I have several thousand pounds, like the sample I have brought here, to be drained when the warm weather approaches. The syrup then is drained easily and quickly, and at less than one-tenth the cost to do it in cold weather.

In planting cane I would recommend high, rolling land, and a southern exposure when practicable. The highest land is less liable to early frosts. I think it is highly important to give cane good cultivation. I found I could produce as good a growth the past dry season as ever, by plowing often, while cane not plowed well failed of maturing a good crop. Stripping cane is rather expensive. It can be dispensed with in cutting the cane from twenty-four to forty-eight hours in advance of your grinding, so that the leaves will become wilted. Cane that is used in this way in the early part of the season care must be taken that it is not left in piles over night as it will heat much more readily as the leaves shut out the circulation of air. In grinding the cane I find it very important to scald out the sprouts at least twice in twenty-four hours and the storage tanks once in three or four hours.

I usually introduce a little lime to neutralize the vegetable acids

always found in the juices of the cane. For perfect defecation, I use more lime, which makes the syrups darker, but they are the freest from vegetable matter which is termed by some the "fodder taste." For table use this is what we always use. There is no positive rule in applying the lime; if you get too much it injures the product, if not enough it does not remove the impurities. The manufacture by the use of the Porter Steam Evaporator is so simple and easy, the main point with me is to supply juice enough. I have spent the largest share of my life in the manufacture of cane products, but if I was a young man and could see in the industry what I see now, I could do my work over again and even do it much more successfully as the obstacles are now overcome in manufacturing. After the past season's experience I would not accept a vacuum pan if I could have one given me. I examined the products of these pans at New Orleans from Kansas. It was the opinion of Dr. C. A. Crampton, government chemist in charge, and others, of considerable note, that the open pan-work from Minnesota was much in advance. He made this remark, "Your product is so far ahead no one questions the justness of the award." After twenty-eight years of practice in growing and manufacturing amber cane in the state of Minnesota, I think with careful cultivation and a thorough knowledge of the business, in at least the southern portion of the State, south of latitude 43, it is a safe, profitable industry; that it adds an important factor of wealth to the State, makes us more independent and adds to our wealth. If the dairymen have a right to protection the laboring classes that buy syrup for pure syrup that is badly adulterated ought to be protected. When glucose syrups come up the Mississippi by the thousand barrels and come into every town and village, and so cheap as to seriously interfere with the production of good syrups, is it not time that our law-makers look after them? The sugar planters of Louisiana are seriously effected, as their products as made by them are pure, but they are bought up and mixed so that it has seriously interfered with their industry in having placed on the market impure New Orleans goods.

I have from my own personal knowledge found there are hardly any pure syrups on the market, except the products made here at home. The wholesale houses can buy the mixed goods so as to make a better profit; the merchant can buy these same goods so he can make a better margin. This leaves the manufacturers with no ready market for their product, except where they have built

up a local trade, and at prices about the same as the mixed goods, and that class of goods sold as *pure goods* is what beats this industry. I believe if once well understood and presented in a proper way by this Association, this wrong may be corrected; and I think we should ask our representatives at Washington to continue the investigations now being prosecuted through the agricultural commissioner, in investigating the Northern cane industry.

The following paper was then read :

THE MECHANICS AND CHEMISTRY OF HEAT AND
THEIR APPLICATION TO EVAPORATING SHALLOW
BODIES OF LIQUID.

By Mr. B. Densmore, Red Wing.

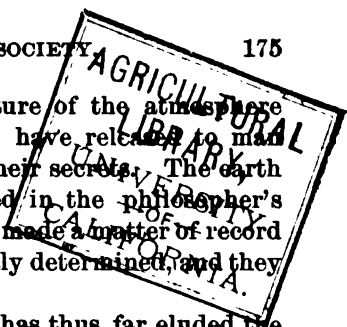
The prime factors in problems of mechanics are time, space, weight and motion. They occur in infinite variety and application, and enter in some form into the investigation of work done, or being done, or to be done.

Chemistry, in many of its features, is not unlike mechanics. It considers the nature and properties of bodies and the laws by which those properties are maintained or changed. The prime factors in chemistry are, at the present time, about sixty-eight in number, and their combinations and properties are always affected in accordance with fixed laws, many of which are already known and followed by the chemist in his researches.

In the rugged and materialistic philosophy of the ancients, there were recognized four elements only, and they regarded them with much awe, admiration and reverence; and well they might, for what was true of them then is equally true to-day, for "the heavens declare the glory of God and the firmament showeth His handiwork;" for "the sea is His and He made it;" for "the earth is His and the fullness thereof;" and "the fire and hail, snow and vapor and stormy wind fulfill His will."

To neither of these elements has there been aught added, nor from either has there been aught taken, and they are the same to-day they were centuries gone by — indispensable to the existence and happiness of man, and daily ministering to his every want.

The philosophy of the nineteenth century bears much the same relation to that of ancient days as the fruit bears to the tree.



We have learned somewhat of the nature of the atmosphere and of fire; and the earth and the sea have released to man largely of their treasures, and many of their secrets. The earth and the sea and the air have been tried in the philosopher's scales, and many of their salient features made a matter of record; their magnitudes have been approximately determined, and they have been "weighed in the balance."

Unlike these, the fourth element, fire, has thus far eluded the pursuit and grasp of the philosopher and the chemist.

Even to the present generation, who have harnessed the lightning and caused it to do the bidding and work of man — to send messages throughout the length and breadth of the land, and to turn night into day — even to them fire is yet accepted as an almost unfathomed mystery.

Heat and light are the only contributions yet made by fire to the vocabulary of science, and to neither of these have been ascribed the qualities of magnitude and weight.

Like their cognates — electricity and magnetism — they have no sensible weight varying with concentration or intensity, nor have they a defined location. They are found everywhere and under all circumstances, and their presence or absence is always noted in the matter-of-fact way of every-day life.

Heat is a term employed in a general sense and without special reference to source or degree, and to denote cause and effect — one or both.

With reference to its status or condition, it is classed either as sensible heat or as latent heat. Sensible heat requires but little in the way of definition. It is heat proper, or tangible heat; it is heat simply, and in the free and general acceptance of the term. Latent heat is described as "that portion of heat which enters into a body while changing from a solid to a liquid form, or from a liquid to a gaseous form, and without altering the temperature of that body." Thus latent heat is that portion or quantity of heat necessary to employ in converting a block of ice at 32° temperature into a body of water at 32° temperature, which, we propose soon to show, is an inappreciable quantity. The same theory holds good also relative to the conversion of water into the gaseous form of steam.

The term latent, and the definition given, although generally accepted and used, seems to want relevancy and fitness, and to be unwisely chosen.

To continue to heat a body without changing the temperature of that body, is at least paradoxical.

In instances of this character in our philosophy, mechanics and chemistry come to our relief. If we wish to cause a specified change in the relative position of a certain body, we call into use the three factors, power, space and time, in such relative proportions as may be required, and the change in position is made. If in chemistry we wish to make a compound of specific character, we combine in due succession and quantity the materials necessary to make that compound. If in any of the arts or in any of the industries of life we wish to work out changes or conditions through the aid of heat, we employ the latter in such form and for such a period of time as may be necessary to produce the result desired.

If we wish to make the compound known as steam, we combine the two elements, heat and water, in the requisite proportions and for the required length of time, and when the formation of the compound has been once established it will continue as long as the conditions necessary to its formation are maintained. Under ordinary conditions, in an open vessel, and at sea level, steam is formed at a temperature of 212° . Up to this point and time there has been no perceptible change in the outward appearance of the compound, but by the addition of one degree more of temperature, or heat, the conditions for producing steam are fulfilled, and steam will be formed with a rapidity due to the proportionate and relative quantities of water and heat employed.

By increasing the intensity and distribution of the volumes or atoms of heat disseminated through the water, the latter is gradually consumed and in a manner fully paralleled by the welding and fusion and final oxidation or burning up of iron or steel under the influence and action of a high and aggressive heat, as is often witnessed in the furnace or forge.

Theoretically, steam occupies 1,700 volumes of space of the same magnitude as that occupied by the volume of water from which it was produced, and 1,700 volumes of steam, in time, contain sufficient heat to raise $5\frac{1}{2}$ volumes of water from normal temperature to a temperature of 212° .

It may be possible, by a very slow and careful process, to produce this change in the temperature of a body of water without perceptibly establishing among its atoms the principle of motion.

This, however, is in reality established almost at the outset of the process, and it increases in activity and strength so long as the temperature is being increased.

If we desire the compound steam possessed also of this mechanical property — motion or power — we cause it to be made within the confines of a steam boiler, and even here should the quantity of heat employed in a given time be too small, the compound does not advance beyond the condition of warm or hot water. On the other hand, should the heat be of sufficient intensity and applied rapidly enough, the resulting compound is steam possessed of mechanical energy known and denominated as a pressure of a certain number of pounds to the square inch, and therefore capable, mechanically, of developing an equivalent of motion or power.

In this form it is extremely infractious and unstable, and if at once liberated from the confines of the boiler, it immediately expands to the full volume, developing all the motion and power due to the pressure, and then as quickly resolves to its normal components — heat and water; and the heat is disseminated through the surrounding atmosphere, while the water falls to the earth. Or, on the other hand, if a body or an element low in the scale of temperature be placed in contact with the boiler, the steam immediately releases all the heat it contains above 212° , the pressure within the boiler is as instantaneously removed, a vacuum produced, and the boiler collapsed from without by the pressure of the surrounding atmosphere.

Again, should the pressure of steam within the boiler be greater than the boiler can withstand, the latter breaks and opens and the steam escapes into the open air.

It is not necessary to enter upon the details of an instance in which this powerful and fitful compound of chemical and mechanical energy as daily generated in our steam boilers throughout the land finds escape from its confines and spreads havoc and ruin in every direction. The concentrated heat is instantly expended in converting the atoms of water each into 1,700 volumes of steam, and for a moment of time space is insufficient to accommodate the immense increase in volume.

The phenomena of combined force or power and chemical change as witnessed daily in the use of steam, is, however, but the counterpart of that seen in the action of water under the influence of frigorific or freezing mixtures. In steam the atoms of water are disseminated through a large space, while in the latter they are locked up in the smallest space possible.

Subjected to the action of a mixture of snow or ice and common salt in the proportion twelve to one the temperature of

water is reduced to zero. If now the third element—motion—be introduced, the temperature is lowered to 25° below zero.

Snow and dilute sulphuric acid, in the proportion of 4 to 5, produces a temperature averaging from 50° to 90° below zero, while solid crystals of carbolic acid, in passing to the form of air or gas, will, by absorbing heat from adjacent bodies, reduce their temperature to 148° below zero, or 180° below the temperature of freezing water. This is the lowest possible artificial temperature yet attained.

A vessel of water subject to no exterior and disturbing influences, may sink in temperature several degrees below the freezing point, and without congealing. but should the vessel now be shaken lightly, or a small portion of water be removed at this time, thus introducing into the mass the element of motion, ice is formed at once throughout the body of water, and the process of freezing thus inaugurated goes on uninterrupted until the whole body of water is converted into a mass of ice.

But the phenomena of motion does not cease with ceasing to be visible to the eye. During the change from the fluid to the solid form, the atoms make a final change of position requiring somewhat more of space, and to meet this demand the inelastic vessel is burst asunder.

Thus we see the compound, heat and water, in two extremes of status or condition. First, that in which the heat is carried to a high proportionate quantity; and second, that in which heat is reduced to the lowest possible proportionate quantity. and that in either case the active and mechanical principle of motion is present, thus fully demonstrating the close alliance always existing between the elements, fire or heat and water and motion, the prime resultant of all problems in mechanics.

Water and iron are two substances entirely unlike in their composition, their structure and their nature, but there is a close similarity in their actions while under the influence of heat. Either of them increases slightly in volume with the first additions of heat. Free motion is established among the atoms of water almost from the moment heat is added, while free motion among the atoms of iron does not take place until the mass has reached a temperature of about $3,000^{\circ}$. If now a small per cent of water be added to iron at this temperature an immediate and terrific explosion follows.

Sufficient heat is at once imparted to the water to convert it instantaneously into 1,700 volumes of steam, and the molten iron

acting as a barrier to the escape of the steam holds the latter under compression and until with increasing temperature and corresponding force it escapes from its confinement.

In this phenomenon the dispersion and distribution of the molten iron is as complete as is that of steam in the exploding steam boiler. In either case the principle or element of motion is the open link between cause and effect. The condition determining whether the result shall be one of safety or disaster. In the example of the molten iron this resultant is too impetuous and infractionous for any and all practical purposes, and its employment is never attempted by operators of good judgment. They prefer to let the liquid return to its normal temperature unmolested and to allow the heat it contained to go to waste rather than attempt to utilize by compounding it with water.

The practicability of employing the compound—heat and water—for the purpose of evaporating liquids lies, first, in the fact that the resulting element, steam, has for equal volumes a weight of only the 1-1,700 part of the water from which it was generated or about 35-1,000 pound to the cubic foot under light pressure, and 2-10 pound under working pressure, and therefore yields readily to the impulse of motion and can be conducted from the steam boiler in pipes to any point with very little expenditure of power or loss of motion save that required to overcome friction—and, second, the perfect adaptation of steam to evaporating purposes is by reason of the great rapidity with which it resolves into its original elements the moment it is brought in contact with a body of comparatively low temperature.

Under a boiler pressure of 70 pounds to the square inch the temperature of steam is about 315°, and as 300 volumes of this steam contains sufficient heat to convert one volume of water into steam having a temperature of 212°, it constitutes at once a most powerful and efficient agent for conveying and imparting heat to any body of liquid, the volume of which we wish to reduce by evaporating a large per cent of the water it may contain. It is powerful because of the slight affinity existing between the component elements at a temperature above 212°, the extra abundant or latent heat being imparted instantaneously to surrounding objects. It is efficient because of its extreme mobility, moving quickly in any direction where it may escape confinement and find a body to which it can transfer its burden of heat, and lastly, but by no means of least importance, it is

the most valuable agent for conveying heat to this liquid to be evaporated, as its use implies security against damage by reason of overheating or burning.

The temperature of steam can no more be higher than that due to the pressure per square inch, than the steam can rise higher than the fountain; hence the complete protection from all liability to damage or deterioration due to a high, irregular and aggressive heat. Even should the steam pressure be carried as high as 120 pounds to the square inch, the temperature would not exceed 340° and the persistent or effective temperature in the shallow body of liquid being evaporated, would vary but little from that found with a pressure of 70° . With the latter pressure the temperature of the liquid in which the steam coil or pipe is submerged will not, under the ordinary conditions of evaporation, vary much from 215° to 220° .

This relatively low temperature is, however, directly dependent upon maintaining a shallow body of the liquid being evaporated. The depth of this incumbent upon the steam pipe or coil acts as an obstruction to the free and liberal escape upward of the bubbles of steam formed at the coil, and should it be allowed to increase there will be a corresponding increase of the resistance and a like increase of the temperature until the latter is nearly if not quite equal to that of the steam within the coil. Thus the liquid being evaporated is the chief condition which determines and regulates this temperature, and it is easily seen that to keep within the lowest range of temperature the depth of the liquid must be kept at the lowest practicable, and maintained at that depth with all the accuracy possible.

In evaporating a deep body of cane juice by means of heat radiated from a steam pipe or coil in the bottom of the vessel there is a reckless waste of fuel and time and a wanton destruction or breaking down of the most valued properties of the juice. The chemical and mechanical factors involved are the same, whether the liquid be in deep or shallow body; these are heat, pressure, time and space.

If in shallow body, these factors develop almost instantaneously the phenomena of bubbles of expanding steam escaping from the coil without resistance, and consequently at the lowest range of temperature, and, by reason of their expansion constantly diminishing in temperature. If in deep body, the incipient bubble of steam remains attached to the coil until all the factors of the phenomena are reinforced sufficiently to enable it to detach from

the coil, and, overcoming the resistance offered by the superimposed body of liquid, wend its way to the surface.

In a mechanical way evaporation has been established, force has been employed and resistance overcome, but meanwhile other attending chemical agencies have been at work. Temperature had of necessity to be intensified in the bubble and the principle of mechanical equivalents complied with before it could start on the journey upward.

The necessarily excessive and persistent heat has inverted a sensible quantity of the cane sugar and has left indelible impressions upon every element of the liquid even to branding them with the unmistakable legend "tried as by fire."

Persistent heat is a powerful agent in chemical phenomena, in fact there are many chemical changes which can not be produced without its special employment. The heat may be strong and of brief application or it may be mild and applied continuously through protracted periods of time, but the results in either case are identical. Given the conditions necessary to produce a certain chemical change and that change will surely and in due time take place.

The effects upon cane juice of high and persistent heat continued through a short period of time and of a low heat continued through a long period of time are analogous. In either case or under either condition the heat co-operates with the normal acids and with the acids of lime and sulphur, if used, and converts the cane sugar into grape sugar or glucose, and with due regard for the physical laws involved, either of chemistry or mechanics, the status of the phenomena may be reduced to a statement of equivalents, and the results placed one opposite the other with the sign of equality between them. It is simply a question of cause and effect—given certain causes and the effect due to those causes is sure to follow.

If in evaporation we employ but a very shallow body of liquid—scarcely enough in quantity to cover the coils—the effects of the heat are at once marvellous and concise. Being instantly expended in converting the volume of water into 1,700 volumes of steam, and there being no superimposed body of liquid to obstruct free radiation and quick absorption, the 1,700 volumes instantly obey the impulse and law of expansion and recoil, and each bear but a fraction of the original volume of heat, and are consequently rendered powerless for working injury to or breaking down the sugar properties contained.

It may not be reasonable to assume that the full force and effect of the proposition of one to 1,700 takes place, nor is it necessary to assume that such is the case, for all the factors of the problem—heat, time, space and motion—are still present intact and in full force. The law controlling their presence holds good until the bubble reaches the surface and explodes. When the bubble expands the heat it contains expands also, and is thus rendered less intense, and instead of being persistent or aggressive is neutral and passive.

But the heat is not all diverted to the production of steam. A large per cent of it is taken up on the way by the impurities of the juice.

To eliminate them or separate them from the juice is one of the highest aims of the sorghum worker, and there is no agent better adapted and none so efficient and concise in its workings to produce these results as heat when embodied in steam and applied to evaporating a shallow body of liquid. In a deep body the continued application even of moderate heat "diffuses" the "impurities," and develops all their objectionable properties, and they mix with the liquid and become inseparable from it. A continual application of persistent heat produces the same result with only a difference in form.

All the long or continued boiling you may give the juice seems only to deepen a dilemma, for by so doing the impurities become thoroughly incorporated and fixed. The color is changed from amber to dark or black; the flavor speaks of impurity instead of purity, and the cane sugar has been replaced by a product of low commercial value.

In shallow evaporation the impurities contained in the juice are immediately affected by the heat. They are dessicated to an extent which renders them buoyant and at the same time concentrates them into the form of pellicules or spawn, and while in this form should be removed with precision, neatness and dispatch.

REPORTS FROM MEMBERS.

Reports from growers and manufacturers of amber cane being called for, the following verbal reports were made:

Mr. J. F. Porter of Red Wing, said:

Mr. President: I have done about the least sorghum work this past year of any year I have been in the business. I have only made 2,424 gallons of syrup. The cause of the shrinkage was mainly chinch bugs; they got in and used about two-thirds of the cane, so there was not a large amount to work up.

Capt. Blakeley. I would be pleased if those relating their experience would indicate what success they have experienced in the growth of the plant as well as stating the amount produced. We want to know as to the influences at work during the season, and get such information as we may as to climatic influences, etc.

Mr. D. Day. Mr. President, my experience has been about like that of Mr. Porter's, only rather to the worse. The chinch bugs took at least three-fourths of the cane, and in some instances four-fifths, in my vicinity. There were large pieces that were worth nothing; while some pieces made a good article of syrup, the larger portion of the area planted was destroyed by insects. I do not know how we can head off the chinch bugs; I would like to have some one give a receipt for it.

Capt. Blakeley. Continued experiments have been made to solve that question, but so far, I believe, without accomplishing anything very definite.

Prof. Porter. As bearing on that subject we have emphasized the necessity of continued experiment and observation to solve the thousand and one problems bearing upon agriculture in all its varied departments. These experiments as they are carried on are at altogether too much cost. They require the continued effort of years and there is too great a field of inquiry to claim the attention of a single individual. This work should be devolved upon the state and nation, for the reason, in the first place, that the cost is too great for any individual to assume; and secondly, the work itself should be "immortal." The agents who carry on the work are certainly very mortal. Men commence these lines of experimentation and they go on with a very great enthusiasm for twenty or thirty years, and then death strikes them and they drop, and in ninety-nine cases out of a hundred the work dies with the man. We should put this experimental work in such a shape that when the individual having it in charge drops out, his successor in the same line shall step in, take up and carry forward the work and not be required to begin *de novo*. He should commence where his predecessor left off, roll the ball along for twenty-five years, more or less, and then let another go on with it for twenty-five more, and so on. This can only be accomplished by having such work carried on by the state or by the nation.

Now, in this line of experimental work there has been progress made every year since 1839, when Boussingault in France, esta-

blished the first practical laboratory under the authority of the government; and from that beginning, France has increased the numbers of her stations, until she now has forty-eight of the very best equipped agricultural stations in the world.

In 1840 Baron Liebig took up this work in Germany. There was not a single laboratory at that time in that empire where experimental work could be undertaken; Baron Liebig was the first. All the advancement made in experimental work in those countries has been the work done within the past fifty years. At the present time there are in Germany alone probably over one hundred stations, and every civilized nation of the world has undertaken the work, and it is the best and most productive line of work the nations can undertake for the benefit of agriculture. The establishment of these stations in France and Germany have brought about results which are most surprising.

This matter of the establishment of agricultural experimental stations in the United States is of very recent origin. The first station, I think, was established in Connecticut in 1875. In New York stations were established, one or two of which are maintained by individual enterprise. We have now some twenty-five or thirty independent stations, established as such, or in connection with the agricultural colleges of the country. They are mainly doing efficient work, and some of them are sustained by liberal appropriations. New York appropriates \$20,000 annually in support of its experiment stations. The amount appropriated for these stations in the country runs from \$2,000 to \$20,000 per state.

Two or three bills have been introduced in Congress within the last four years looking to the extending of national aid to the promotion of these objects. There is at the present time an important measure pending known as the "Hatch Agricultural Experiment Station Bill." It has been unanimously recommended by both the agricultural committees of the house and senate and has passed to a second reading in the senate. I hold in my hand a petition bearing upon this subject which will explain the object of this bill.

Prof. Porter here read a petition for the passage of the Hatch Experimental Station Bill so-called and then presented the following resolution:

Resolved, That the officers of this association be directed to prepare, sign and forward to the senators and representatives of Minnesota in the National Congress a request that they use their

influence and their votes to secure the passage by the present Congress of the bill known as the "Hatch Agricultural Experiment Station Bill" for the purpose of securing the establishment of at least one agricultural experiment station in every state of the Union, such measure being in the line of progress in agricultural science.

The resolution was adopted.

Mr. Kenney. I did not find any chinch bugs in my cane at all. The season was very dry and I began to cultivate early and kept the plows at work. I think I got as good a crop as I ever raised. I notice where they did not have so much cultivation the cane was smaller and inferior, and the juice was not as good as in other years. I never had better granulation; everything was full of grain. In one barrel of syrup sold to a merchant there was one hundred and thirty-two pounds of mush sugar when the syrup was drawn out. I am surprised at the results that can be had with open evaporation on Mr. Porter's pan, and it has filled me with enthusiasm. If such results can be had at eight degrees what may we not expect when we have cane yielding juice of a strength of ten or eleven degrees? Last season, on account of its dryness was the best for granulation purposes in a number of years. Still I look for better seasons in the future and with good cane seasons and our improved machinery we are going to have an opportunity to show the world what we do. The possibilities of this industry are scarcely realized at the present time, and I believe it is coming to the front, and is going to be an important factor of wealth for the farmers of Minnesota. I look for important results to come from our knowledge of clarifying the juice which we now have and am more enthusiastic than ever as to this industry. Where we can do the work so safely and boil a gallon per minute you can see there is no chance for inversion; where there are good facilities afforded for cooling we can have solid sugar in a short time where kept at about ninety degrees for two or three days.

Capt. Blakeley. You do not attribute the failure of the cane product to the weather?

Mr. Kenney. A high wind struck the cane before it was ripe and blew down a good deal of it and those pieces that were most injured by wind had the lowest saccharine strength; some of it did not amount to half what I expected.

Prof. Porter. As emphasizing the importance of the work of the experiment stations it may be cited that seventy years ago the amount of sugar obtained from the juice of the beet was

about one per cent and by the result of persistent experimental work directed exclusively to this object, the percentage has been raised in Europe to thirteen per cent.

Capt. Blakeley. If that has been done with the sugar beet what can not be done with amber cane? It is said a man was indicted for having brought it up to thirteen.

Prof. Porter. When we take steps to increase the saccharine strength of amber cane we shall go far in the direction of placing the industry on a permanent basis. As the result of my experience and observation I have found the greatest difficulty to overcome in the development of this industry is to get the agricultural community to turn their attention towards the cultivation of the sugar cane, they all acknowledge the profit there is in it, its value as a crop and the importance of it for the community, but as soon as they are ready to grow cane they drop back into the old ruts of raising their rye, oats, barley and grass, and the same thing year after year! When a new candidate for favor comes up, it has to fight its way and show itself to be about five times as profitable as anything else before it will get an introduction and become a favorite. I was at one time engaged in the beet root industry for about four years in the East and as the result of our efforts we were enabled to get nine to ten per cent from the beet and make the business pay a fair return. But the trouble was to get enough beets to run more than two months out of the twelve, and we could not induce farmers even with the aid of large bonuses to grow the beets in sufficient quantity to keep the factories in operation. This is the experience with the amber cane. You can't get material enough to keep your mills going. It is not because the sugar isn't there or because you can not extract the syrup, but you can not get farmers to grow more than enough to supply their home mills, and of course capital will not be embarked in the enterprise.

Capt. Blakeley. What can you say as to the experiments with the amber cane upon the state farm; can you give us a short report as superintendent?

Prof. Porter replied that the work upon the state farm had been in progress the past four years in getting well established and in a condition for work as a practical experimental station. First the land was bought, cleared up, the farm buildings erected, fenced and supplied with proper tools and machinery. It was now in a condition to be one of the best equipped stations in the United States. It was now in a condition where all that was

needed was to get the "steam" in the boiler. As yet there had not been a dollar of money furnished to set the machine at real work and they were waiting the action of the present legislature to forward the enterprise if such an institution was desired to be established permanently here in Minnesota.

Capt. Blakeley. What is the present status of the farm? Is it run by a sort of private enterprise or maintained by means of state aid?

Prof. Porter. Our experiment station was established by the department of agriculture of the university of Minnesota as a part of the equipment of that college, and the farm stands simply as the workshop or farm laboratory of the college of agriculture. A place where the teachings of the text-book, class room and laboratory will find their practical illustration in the field, garden and stable, where young men may become familiar with all the operations of the farm.

Two years ago this winter the legislature passed an act authorizing and requesting the board of regents of the state university, as soon as practicable after the passage of the act, to establish a state agricultural experiment station, placing the direction of it under that board and appointing the professor of agriculture in the university as the superintendent of that station, and the law stopped there; there were no funds appropriated for the purpose of setting the thing in motion. Of course the university was going right along and doing this work, and it was the purpose to make it an experiment station. The State steps in and authorizes this work, or what answers the same purpose. But the work thus far has been carried on as I say, without a dollar appropriated directly from the state funds.

Six years ago we had a farm costing us some \$8,000 perfectly unfitted for the purposes for which it was designed. That was sold, another farm purchased which has been converted into a magnificent plant now estimated to be worth \$500,000, all thoroughly equipped for a first-class agricultural station. In that length of time I have been professor of agriculture, farm superintendent, farm foreman, built all the buildings, purchased all the material, paid all the bills and superintended all the work carried on, and this last year acted as superintendent of the farmers' institutes. Now, then, I submit it is utterly impossible for one man to do everything. If this work is to be carried on successfully and properly, the State must come in and make such appropriations for the completion of the equipment

as its importance demands. We have two hundred and fifty acres of land located midway between the two cities, and the question is whether we should be all the while going to do, and getting ready to do, and let generations pass away before we can accomplish anything.

The committee on samples reported verbally to the effect that they found on exhibition several fine samples of sugar and syrup exhibited by Mr. S. H. Kenney, and a beautiful model of Porter's Perpetual Steam Evaporator, exhibited by the makers, Densmore Bros., of Red Wing, Minn.

Capt. Blakeley stated that the sugar industry needed protection by the government until the country was able to compete with foreign countries. England in 1845 became a free trade nation, as it was able to withstand competition. For the present we should have protection, especially for the promotion of the sugar interest.

Mr. J. M. Smith, of Green Bay, Wis., having arrived was introduced and said: He had been reminded by a statement in regard to the adulterations practiced with glucose, of a statement made by one of their United States senators to him some time since, that an effort was to be made to repeal the oleomargarine bill, and said that the dairymen of the country would kick up a row over it before it would be repealed. He added that if farmers would act their part the next bill to be passed of importance would be one against all adulterations of food products of all kinds; such a bill could be and would be passed just as soon as farmers indicated that they desired such a measure. He thought such meetings as this, and associations of this kind in this State, in Wisconsin, in Illinois and other states, should take this matter in hand and endeavor to have this project carried forward. There should be the most stringent legislation to prevent the adulteration of food; and it would be easily secured if the wants of the people were properly presented and made manifest.

Prof. Porter said the resolutions adopted by the Indiana Cane Growers and approved by this Association asked for legislation looking to the repression of adulteration of sugar, syrups and similar products.

Capt. Blakeley stated that this effort to secure this protection against adulterations of that character would meet the hearty approval of all and it was desirable that there should be concert of action in this regard.

On motion the meeting then adjourned.

AFTERNOON SESSION.

WEDNESDAY, JAN. 19, 1887.

President Elliot stated, upon the adjournment of the Amber Cane Association, that there was time for an hour's session of the State Horticultural Society.

The committee on the president's annual address presented the following report, which, on motion of Mr. Brand, was accepted:

REPORT ON PRESIDENTS'S ADDRESS.

The committee recommend that every school district in the State be furnished a copy, bound in cloth, of the annual report of the Society.

In the matter of experimental stations we are in favor of the Hatch bill and of the location of the new stations in the prairie districts.

If means can be had we are in favor of a primer of Horticulture for use in families and schools; treating of the primary principles of fruit growing and gardening and profusely illustrated.

We recommend the setting aside of fifty dollars or so much thereof as may be needed, for the purchase of books and pamphlets for the information and aid of the Entomologist, the books to belong to the Horticultural Society, to be kept at the Agricultural College Building when not in use.

We indorse the recommendations made in regard to the better organization of committees; also as to the improvement of the state fair grounds. We suggest, when these improvements are made, that it will be a good place for the Society to celebrate Arbor Day.

We approve of the recommendation requesting the State Agricultural Society to give special premiums for outside county exhibits and the giving of equal special sweepstake premiums for the counties of Dakota, Hennepin and Ramsey.

We suggest that in the floral department the premiums for amateur exhibits be passed on by committees composed of amateurs.

We approve of the recommendation for the increase of the secretary's salary, and recommend that it be made five hundred dollars.

TREE PEDDLERS.

Mr. Smith stated that the subject of tree peddlers was discussed by the committee, but had been inadvertently omitted from the report.

Mr. Harris said the committee thought the legislature should pass an act requiring all agents working outside of the county where a nursery was located to file a certificate of agency with the clerk of the court, giving the name of the nursery represented, with a list of the varieties of trees offered for sale, and prices, providing in the act that fraudulent representations should be deemed to be a misdemeanor.

Mr. Smith presented the following, as the sense of the committee on the subject:

In the matter of tree peddlers we recommend that they be required to take out a license, and to file with the clerk of court a certificate of agency and an affidavit as to the location of the nursery represented before receiving license; that canvassing for fruit trees without such license be made a misdemeanor, with punishment by fine or imprisonment.

Capt. Blakeley. I would suggest that you make it cover all horticultural products instead of apple trees simply. These agents sell at almost every house, exhibiting colored plates of plants, something or other, which they represent belong to a big nursery close by. It should include trees, vines and plants, and the selling of these without first obtaining such license should be made a misdemeanor.

Mr. Brand. Why not include shrubs?

The resolution was amended to include trees, plants, shrubs and vines, and the report as amended was adopted.

Prof. Porter presented the resolution adopted by the Amber Cane Association, found on page 184, and moved its adoption, which motion prevailed.

Mr. Harris stated he had made inquiries in regard to the firm of L. L. May & Co., and had been unable to find any nursery of such firm within the state of Minnesota. Even if there was, the conduct of the agents of the firm deserved to be condemned. He had seen some of the stock sold by their agents, giving an in-

stance where an order for stock worth some seven dollars and fifty cents had been filled at twenty-five dollars. He thought their swindling operations ought to be exposed. He did not believe they grew a tree themselves.

President Elliot said he understood this firm had an office here, but were handling stock grown in Western New York.

Continuing, he said there had been an agent around this last summer representing Augustine & Co., who had called upon him to get an order; not having much to do he sat down to listen to his story; he was one of the "greenest" men in regard to stock one could imagine and knew scarcely anything; with a pencil and card he took some notes, which were amusing to say the least. This agent made the most absurd statements as to the stock he sold and its hardness; had his plate books, with specimens greatly overdrawn as to size and coloring; his stuff was all hardy and outrageously high. For instance, he charged \$1.50 for the Tartarian honeysuckle; Transcendent crabs, worth \$10 to \$12 per hundred, 25 to 75 cents apiece, etc. He was most amused with a statement as to a new lily of which the company had been able to secure all the stock, amounting to some eleven bulbs, at an expense of \$250; he asked the agent if there was any way he could get three or four, and he replied he didn't know but he might manage to furnish one at thirty dollars! That was the style of this class of men that were going all over this country, and if there was any law to reach them, why not have it put in force? why should not Wisconsin, Dakota, Iowa and Minnesota join hands in this matter to get a law enacted that would put a stop to these fraudulent transactions?

Mr. Brand stated that he was acquainted with the firm of May & Co. only by reputation; that he had examined some trees near Mr. Brimhall's place last summer, purchased of an agent, and found among them trees that he recognized as Ben Davis. He had lost 150,000 of that variety in 1873 and knew the variety well, although the labels read "Wealthy;" found some Early Harvest labeled "Tetofsky." Agents had been selling stock in Rice County last season which was untrue to name; Pewaukee was sold for Transcendent, etc. These things were regulated by law in the Southern States; in Alabama and Mississippi their laws provided for a bond in the sum of \$10,000 with a license fee of five dollars, for each town in which orders were taken for nursery stock. The law, however, was not entirely satisfactory; the agents were hard to get rid of.

Mr. Smith. Such a law would not hurt the honest dealer.

Mrs. Stager inquired if there was such a thing as a "strawberry tree," which grew three feet high and bore fruit so one could stand up and pick it; this was one of the things sold by L. L. May & Co. Several of the trees had been sold to mechanics at Sank Rapids.

Mr. Harris said there was a tree called the Wahoo which was probably the species referred to. A firm had been operating about Caledonia and he had been called upon to examine some of the stock delivered there. He found they had been selling trees at ten dollars a dozen, calling them the Gideon apple, which in every respect resembled the Ben Davis. Another firm had been operating in this country, representing to sell stock from the Sparta Chain Nurseries, while the stock was grown in Southern Ohio. They had sold budded trees representing them to be hardier than root grafts. He had been to Sparta, Wis., and found one nursery of less than two acres, planted with one and two year old crabs chiefly, with barely a carload of such trees as the firm in question sells.

Mr. Labbitt inquired how many nursery firms there were in this State that sent out stock true to name; he had not found one of them yet.

Mr. Smith thought the greatest obstacle to the fruit growing interest was the fraudulent practices of tree agents, as people who patronized them not only lost their time and money, but lost faith in fruit growing in the State. This project of licensing might be a check, but the only successful remedy was to educate the people against purchasing these untried new varieties. He had been in the Red River country, where they were infested with tree peddlers selling "hardy" Russians, one agent representing that his trees were imported direct from Russia. In the northern part of the State a gang of some fifteen men had been working, under a leader; one of their specialties was a wonderful combination which nobody else had called the "Hardy Hybrid Perpetual Rose," grafted on a dogwood tree. [Laughter.] He referred to several other instances within his own knowledge.

Mr. Labbitt. Mr. President, I have paid out in the last ten years, I guess, over a hundred dollars for fruit trees, etc. I live very near a nursery; in the spring I used to drive up to get my trees, and, as I supposed, bought a good many Duchess trees, which did not prove to be of that variety; I bought several of the Wealthies without getting one. I finally thought I would

change, and so Mr. Gibbs ordered some trees from La Crescent; the result was I got one Duchess and two of the Wealthy out of twenty-five. The nurserymen in this country are scarce who practice no fraud.

Mr. Harris. Did you say you got them from La Crescent?

Mr. Lobbitt. Mr. Gibbs said he ordered them from there.

Mr. Harris. I will say that I never propagated any trees for sale.

Mr. Lobbitt. I didn't say it was you. [Laughter.]

Mr. Harris. There is no nursery in La Crescent and there has not been for twenty-eight years.

Mr. Lobbitt. The trees were all right so far as growth was concerned, but not true to name.

Mr. Sias. I have just come in from the ice carnival and feel too cold to talk, but would like to ask the gentleman if he ever bought any trees in Olmsted County?

Mr. Lobbitt said he had not, but thought of doing so.

Mr. Allen thought farmers were fond of being humbugged.

Mr. Lobbitt. I am not.

Mr. Allen mentioned an instance where he had cautioned a neighbor against ordering shrubbery, etc., from traveling agents, telling him to order his stock direct from Lake City and he would guarantee it would be satisfactory, as he had dealt extensively with nurserymen and never had received as good satisfaction elsewhere as he had at the Lake City Nursery. But when the agent of a St. Paul firm came along and went at him "hammer and tongs," he countermanded the order and bought of the agent. He had himself bought strawberry plants at a high price of an Eastern firm which had never borne a berry, but he lived in hopes. There were plenty of reliable nurserymen in the State, but the trouble was to teach farmers the wisdom of patronizing them instead of traveling agents.

Mrs. Stager said the agents who had been selling these strawberry trees had represented them as needing no fertilizer and as bearing wonderful berries, whereas the common plants had to be fertilized and cultivated. It looked very much as the gentlemen said, that people liked to be humbugged.

Mr. Harris. A certain gentlemen wrote me inquiring if there is a hardy peach, a native of Wisconsin, and if peaches grafted on the wild thorn would not be subject to the borer? I rise to inquire if they raise peaches in Wisconsin?

President Elliot here introduced Mr. J. M. Smith, of Wisconsin.

sin, who said he had known one gentlemen who had raised a few peaches by bending the trees down and covering them through the winter. As a rule peach trees would grow up in the summer and kill down every winter. As to the statement that there were hardy peach trees it was enough to say that they had not yet been discovered.

Mr. Harris. They are trying to sell them down in Illinois to the "suckers."

Mr. J. M. Smith. In regard to May & Co. I would say that two or three years ago a young man came to me wanting me to help him into some business. He came with a letter from May & Co. and asked me if I knew them. I told him I had met the horticulturists of Minnesota and feared there was a screw loose there somewhere, but was not positive. But they sent on their printed recommendations, etc., and he was induced to act as agent. Their prices were perfectly outrageous; for instance, the Cuthbert raspberry, at two dollars and fifty cents a dozen. I have tens of thousands that I would be glad to sell at a dollar a hundred, as pretty as ever grew. We have been annoyed very much with these tree peddlers in Wisconsin. I am glad to see your Society taking measures of this kind and I shall certainly recommend our society to follow your example at their meeting in February next. We have some nurserymen in Wisconsin whom you can rely upon. I have known them for years as gentlemen and believe them to be upright, honorable men, who will do as they agree. It is very amusing to see so many people humbugged from year to year by these tramps that are running around the country.

Mr. Lobbitt. I don't call it a humbug when I order a thing; the humbug comes in in their clear "cheek."

Mr. J. M. Smith. I have no objections to calling it by that name, if you prefer it.

Capt. Blakeley here referred to the methods followed by agents forty years ago in Virginia and other states and said the experience of the states mentioned was a terrific one.

Mr. Harris inquired if the legislature was asked to give the Society \$500 more to disseminate information among the people, would not the statement be made that too much money was being expended?

Mr. J. M. Smith. The farmers will not object provided they get the books.

Mr. Lobbitt. I would rather pay a dollar tax to get men to

sell what they represent than to pay half a mill to stop other people from buying of these men.

Mr. J. M. Smith. We have adopted a plan in Wisconsin at our institutes that works very well. We are now holding three farmers' institutes a week in Wisconsin, and occasionally four a week. At each institute we have a large number of volumes of our State Agricultural Society with other reports bound in them, and we distribute them at these institutes. The plan now is to have large numbers of them printed the coming year, and perhaps an additional volume with the cream of the institutes, to distribute, so that in a year or so our farmers will be educated and there will not be such good picking for this class of men. The farmers in our State are being waked up as they never were before, and we hope to keep the interest growing; these reports are being called for in every direction. If our sister states will take hold of this work, and the horticulturists and agriculturists will work together, they will find it to their mutual benefit. Our farmers are coming forward and showing an interest never before known in the history of the state.

President Elliot. What is the number of those reports printed?

Mr. J. M. Smith. I think there is altogether some 25,000 and we shall probably have the number increased.

Prof. Porter was very glad Mr. Smith had mentioned this subject; we had been trying to profit by their good example. A year ago the College of Agriculture by its board of regents undertook this institute work at its own expense. They had been doing the work just as fast and as thoroughly as the means at their disposal would permit; they had held thirty-one institutes, besides assisting at others. This had been done with \$1,000. They had felt the want of this literature spoken of; also, another edition was needed of our Forestry Manual of at least 10,000 volumes, with a corresponding number of the Society reports. He was now publishing a report which would contain much valuable matter, but as only 3,000 copies were authorized, there would be very few for general distribution. This Society might act as an auxiliary in this institute work. The legislature had been asked to appropriate \$7,500 for the institute work.

Mr. J. M. Smith. You will find \$7,500 is not enough.

Prof. Porter. We have got to go slow; this legislature is one that was elected on principles of economy. If we expend this sum judiciously we will have no more trouble in getting \$15,000

the next time than we have the amount asked for now. He had seen institutes where the first day farmers would come to the door and look in; the next season a few would come in and sit down; before the meeting was closed, the hall was not large enough to hold the people.

Capt. Blakeley. The question is, whether there is more pleasure to cheat than to be cheated. Legislation of a stringent nature would prevent these fraudulent transactions of tree peddlers in the State; consequently you would be doing yourselves no injury and would be doing the State a great service if you could have an act passed that would abolish these fraudulent practices.

On motion the meeting adjourned till 7 o'clock P. M.

EVENING SESSION.

WEDNESDAY, JANUARY 19, 1887.

The evening session was held in the hall of the House of Representatives and the meeting was called to order by the president.

ADDRESS ON FAIRS.

Mr. O. C. Gregg, of Minneapolis, was introduced and proceeded to address the Society. He said:

Mr. President, Ladies and Gentlemen:

I have been requested to address you briefly upon the fairs of our State.

It came in the order of my duty during the season last past to visit a goodly number of the county fairs in the state of Minnesota, and those visits made a deep impression on my mind and I am glad to have an opportunity to bring before you some of those impressions and submit them to your candid judgment, for approval or disapproval. I wish to say in advance that I do not wish to criticise or allege aught against the fair managers of the state and county fairs, for I have found them almost without exception to be men well advanced in the line of progressive agriculture.

Our fairs as conducted are open to criticism and my first objection is the lack of the educational element.

The people are to be held responsible for fair faults, upon the principle of "like people like priest." Faulty methods have been active and have come to the front, while better methods have been lagging behind. The State supports our fairs by appropriations, presumably as agricultural educators, and our fair managers, as a rule, desire that they shall be such; still it is evident that the educational element is largely wanting. This is not saying that our fairs are failures, for they usually succeed, according to the commonly accepted standard of success, that is, they pay expenses and perhaps a little more. The managers work hard, for no pay, and the people get a horse race, rarely of high order—usually more or less scrub—with an agricultural attachment and fair fakirs admitted. Our fairs have the horse element in them in such large proportion that they are sometimes called "agricultural horse trots."

RACING AT FAIRS.

A manly, robust nature usually loves a horse. The well-trained and well-bred roadster is one of the needs of the day. A cold-blooded, straight-shouldered, paunchy horse is out of place in these days of steam and drive. To raise and train a good horse is as laudable as to raise grain. I believe that true training consists in speeding in natural form, without weights or artificial aids. Intelligent breeding will produce the form associated with the requisite nervous force that speeds itself. Some of our best trotters maintain their highest speed in natural form alone. Good form, mental equilibrium and nervous energy are valuable, for they can be transmitted. Such a value is positive, and its measure of value is often unknown. Hambletonian and old Justin Morgan had so great value that even to-day their value is unknown. Weights and other aids are an open confession of fault in the horse speeded. The true idea should be, not to improve horses by weighting, which is transient, but by breeding, which is permanent. Put the premiums upon horses of permanent values; this would naturally recognize the stallions and mares as first on the list; drive out the pool-seller and jockey, of dark and doubtful methods, and we still would have the horse as an attraction with a value worthy of recognition, and the race of the fair would be an "agricultural horse trot" without reproach.

FAIR FAKIRS.

By fakirs I mean those men who run fortune wheels, cane racks, and gambling devices in general. They should be strictly barred from the fair grounds, for they are but schools of vice. I submit the following "points" bearing on this matter:

1. The State legislates against gambling in winter, but expends its money in autumn to sustain the places where gambling schools are held. The State pays a bounty for wolf scalps; let it now go to raising wolves.

2. The fair is now a bait that brings the farmer within the reach of the net of the sharper; he then is made food of by fakir sharks.

3. Country folk, not worldly wise, are easiest caught; for this reason the highest license is paid by fakirs for these fair-ground permits.

4. These grounds so occupied by games are doubly dangerous, as respectability, like a cloth, covers the hidden trap.

I rest the propositions with the question, "Should these things be allowed?"

GAMING.

I have been compelled to see so much of this that the following short statements concerning it have come to mind and are also submitted:

1. Betting proposes to swap a useless opinion for another man's money; a clear case of getting something for nothing.

2. Betting is backing one's opinion with scrip instead of sense; a bankrupt head banking on the pocket.

3. To "put up or shut up" is to close the mouth of the intelligent poor and open the mouth of the bawling rich. Wisdom is gagged and folly excited to foolishness.

4. Gambling is the action of the child man, the vice of the savage, the foe of industry and the prolific mother of discontent. Gambling has no defenders; society shrinks from it, laws brand it, and its road leads to despair. Surely such a thing should not have any place in the educational centres of a state.

LIQUORS ON FAIR GROUNDS.

Little need now be said here. Public opinion condemns it. The outlook is that proper laws will be forthcoming withholding state aid from fairs where its sale is permitted.

FAIR ATTRACTIONS.

I have no desire to drape the fair, but wish that the crimson hues of vice might be supplanted by the more pleasing colors of joys that bring no pain. Let us welcome the "merry-go-round" that swings its happy burden to the sound of the hurdy-gurdy; the stimulants to feats of manly strength, the national game, firemen and band parades, glass-ball shooting, and increase their number by inducements and ingenuity. Let ample scope be given for "youthful jollity." The fair is now and ever should be a place for pleasure. It should be pruned of those things that lead into doubtful and dangerous ways; the fair should not lead anyone into temptation.

THE FAIR AS AN EDUCATOR.

It should be more of an educator than it is. I submit the following suggestions as aids in that direction:

1. Domestic animals should be scaled by points; the judge should have an outline of a perfect form furnished him as an aid for this work. It is painful to see awards made upon size alone; the world is full of quantity, but is still short on quality.
2. This form test should also apply to vegetables.
3. Grains should be graded by recognized standards. Samples of standard grains should be at hand for comparison.
4. Judging should be done openly; that is a reason given by making an outline, or by verbal or written announcement why awards are given.
5. Standard packages for products and standard coops for fowls, etc., should be recognized; such things educate rapidly.
6. All entries should be made before the fair opens, and judges carefully selected and supplied with outlines and guides in standard measurement. If need be, pay them well and so get good services.
7. Paid and educated judges would be of great value; this paid method already prevails at competitive examinations of a high order.

I close by repeating a former statement, that the faults of the fair system are not the faults of the fair managers.

The following address was then delivered by Prof. Cyrus Northrop, president of the University of Minnesota, upon the subject of "Agricultural Education."

PROF. NORTHROP'S ADDRESS.

Mr. President, Ladies and Gentlemen of the State Horticultural Society:

I have accepted your kind invitation to speak to you this evening, not for the purpose of delivering a literary address or a treatise on horticulture, but in order to say a few things respecting agricultural education, which I think it is well for the State that I should say and say now.

It has been my good fortune to become reasonably well acquainted with your purposes and investigations through the annual reports which you have published, and I come before you to-night with a very sincere respect for you and your work. You have taken hold of that department of agriculture which most imperatively requires special attention here in Minnesota, and which more than any other needs the aid of science and the teachings of experience. You have prosecuted this work with a zeal worthy of all commendation, and with a measure of success for which the entire State ought to be grateful. Many of the papers published in the record of your proceedings are worthy of careful study; and those are not wanting which show the writers to be as refined in taste and as sensible to beauty and as appreciative of the utility of beauty, as the most cultured literary artists. Such a paper is that by Mr J. S. Harris, in "The Model Farmer's Garden," in which occurs a description of what a farmer's home should be, which, if realized to any considerable extent, would add not a little to the happiness of farmers and their families. But, gentlemen, you have done much more than to publish excellent papers. But a few years ago it was supposed that Minnesota was too cold for the successful cultivation of fruit. But you thought otherwise. You experimented and persisted in your experiments when the results were most discouraging. By your wise perseverance and intelligent skill you have made Minnesota the prize bearer of the nation for excellence of apples; you have made it almost the peer of any in the abundance and deliciousness of grapes; you have made strawberries, the most luscious of all small fruits, not only plenty but of great variety and of the highest excellence — while every table in Minnesota is a debtor to you for a variety of food produced here at home, and most conducive to comfort and to health. In the prosecution of this work the names of Gideon, Pearce, Harris, Elliot, and others whom I need not mention,

have become as familiar as household words in connection with the work of this Society, and as benefactors of the State.

If I can not directly participate in your counsels or assist you in your work, I can at least appreciate the value of your work. And I especially desire that, as I speak to you to-night, you shall not look upon me with a kind of pity, as a mere theorist who knows nothing about the mysteries of practical agriculture. It is true that even a theorist may reach his conclusions from a larger induction than the practical man, and so the geologist may be a safer guide in mining than is the practical miner. But I am not even a theorist. My early years were spent on a farm, where I became familiar in a practical way with the whole routine of a farmer's life, including what will some day be more important in Minnesota than it appears to be regarded now, rotation of crops, and the care and feeding of cattle for beef as well as for dairy purposes. I learned how to do things by doing them. I know perfectly well what a farmer's life is; what his work is; and I believe I know what his needs are so far as they relate to education and preparation for his work. This is my only justification for appearing before you at all. While I recognize the fact that the field of knowledge is too wide for any man to be familiar with the whole of it, and while I appreciate the fact that you undoubtedly know vastly more than I about agriculture, I yet modestly hope to lead you along certain lines of thought which will pay for the time and attention which you may give me. I propose to speak upon the subject of agricultural education. I shall first notice very briefly the historical progress of agriculture. I shall then inquire what has been done for agricultural education in Minnesota, and finally, I shall try to show what is needed for the future.

If we examine carefully the history of agriculture, we shall be impressed with the very great simplicity and crudeness of the agencies employed in early times to aid the farmer in his work; we shall be astonished at the slow progress made among the Greeks and Romans, and in the mediæval ages in Europe generally; and in all the world, down even to a comparatively recent time; and we shall be delighted at the rapid strides which agriculture has made in the last half century, not only in respect to machines employed to save human labor, but also in the understanding of scientific principles and their application to farming. It is noticeable that the rapid and marked improvement in agriculture dates from the time when agricultural

societies began to be formed. Some of the societies formed at the beginning of the new era are in existence to-day, and it can not be doubted that the discussions and experiments of these societies have done much to bring on the age of mighty production and of systematic economy in human muscle. At all events, through the publications of these societies it has come to pass, directly or indirectly, that the world has had the benefit of all the good ideas which have been originated by observers or thinkers. This community of ideas, so characteristic of our age, is one great cause of human progress, not merely in agriculture, but in all departments of knowledge. It is no longer one man thinking for himself alone that measures the progress of the race. It is rather multitudes of men thinking for humanity—all eager to share their thoughts and discoveries with one another, and to publish them to the world. Under this stimulus grains have been improved in quality, and vastly increased in quantity; fruits have been multiplied in varieties, and made better in flavor; vegetables have been made to assume unheard of proportions; cattle of improved breeds have taken the place of the stunted and unprofitable specimens of former times, and the dairy has become a most tremendous contributor to human comfort; while the horse has been developed in speed and beauty beyond anything known to our ancestors. And still the work of subduing the earth, so essential to human welfare everywhere, goes on with almost boundless promise for the future.

It would almost seem, indeed, as if the wants of the world would be rapidly met, and a great surplus of unneeded products would result from the vastly increased power of labor; but experience proves that there is no new idea of real value and no new force of real power for which the world can not make room, however well mankind may seem to have been provided for before. It is no longer a question of mere existence with the human race. It is a question of how much comfort, and even luxury, mankind can have in addition to the necessities of life. We no longer think of famine as possible, since it has been clearly shown that there is nourishment enough in the bosom of Mother Earth to feed all her children for ages to come. And the increase in the production of food has not been the result of the employment of a proportionally increased number of laborers, but of the application of machinery to work instead of human muscles. Thus the labor of the world is not unduly expended

in the direct production of food, but it is applied in larger and larger measures to the manufacture of the myriad articles which the genius of man has invented for human comfort and which, from being the luxuries of the rich, are fast becoming the necessities of the poor. Whatever adds to the productive power of labor adds to the sum of human comfort, and especially increases the number of those who can have this comfort. We are therefore under the greatest obligations to those searchers after truth who explore the dark places of nature's domain, and bring to light new forces for the service of man.

But with the advance in agriculture and the recognition of a scientific method in agriculture, the old idea that anybody can be a farmer and that as likely as not education will unfit a man for a farmer's life, has, to a considerable extent, passed away, and there has come instead a demand for agricultural education. This demand is sensible and proper. The supply ought to equal the demand. And it does. No person who desires an agricultural education need go without it because it can not be had. The trouble thus far has been that while a clamor is raised for agricultural education the boys to be educated are not forthcoming, and to educate there must be persons to receive the education. Up to the present time the demand for agricultural education in Minnesota can not be said to have been very great, and I have no hesitation in saying that the supply has been largely in excess of the demand. And if, at the present moment, the demand seems to anybody to be greater than the supply, I answer, in the language of the market reports, that "the demand is mainly speculative and not for consumption." And I add, in the language of the Declaration of Independence, "to prove this, let facts be submitted to a candid world."

In the first place it is to be observed that the regents of the university have not been negligent in the matter of providing facilities for agricultural education. Consider for a moment what they have done.

The endowment of a university in Minnesota was begun in 1851 by the act of Congress granting two townships of land for the purpose. The territorial legislature passed an act in 1851 for the establishment of the university. The state constitution, adopted in 1857, confirmed the previous action and expressly provided for the vesting in the university of all lands which may hereafter be granted by Congress or other donations for university purposes. For reasons too well known to be repeated here,

the university was not really organized and put into operation till 1869. Thus eighteen years elapsed between the time of the first grant for the university by Congress and the organization of a faculty for university work. At first the regents very properly made provision for the education that was most needed and demanded. Full provision was made for instruction in science, literature and arts. For years the provision thus made was sufficient for the wants of the State. As schools and scholarship in the State improved the work in the university was raised, preparatory classes were dropped, till now only one remains, and its days are numbered. Later came the organization of the college of mechanic arts, and of the college of agriculture. Up to this time the sons of farmers, like the sons of everybody else, had had free permission to enter every class room in the university for which they were prepared. Now they were permitted to have in junior and senior years special instruction in agriculture in addition to all the other privileges of the university. In other words, a special college of agriculture, with a two-years' course, was established, to enter which a student must have pursued the college course during the two preceding years.

In due time, also, the regents, in order to fulfill their trust and to do all that was possible for the agricultural education, bought a farm near the university, for the practical experimental work. When the present professor of agriculture came to the State he found the farm unsuited to its intended use, and upon his recommendation the regents sold the farm, and with the proceeds of the sale purchased the present experimental farm, erected thereon a model house and barn, placed upon the farm a variety of stock, recreated — so to speak — the whole farm, so that at the present time it is a most admirable tract of land, a beautiful specimen of what it is possible for a Minnesota farm to be; without a weed in its cultivated parts, and with a rich covering of grass where formerly not a blade was growing. In bringing the farm to its present condition and present fitness for experimental work, and in meeting the requirements of the department of agriculture, the regents have expended many thousands of dollars; and they have spent, year by year, far more for the department of agriculture than they have spent for any other department whatever, and they have done this with a very sincere desire to improve agriculture and to benefit the farmers.

If this liberal policy has not been appreciated, if students

have not come to the college of agriculture, if there has been practically no demand whatever for agricultural education, it is not because the regents have failed in their duty, not because they have not made generous provision for this education, not because they have not been willing to do everything which large-minded men could do to promote so great an interest as the agriculture of Minnesota. And I wish to say here that if the regents have not accomplished directly for agriculture as much as might be desired — as much as they desired — they have at least proved themselves wise trustees of the property intrusted to their care — for they have converted property which originally cost them only \$8,000 into property which could easily be sold to-day for \$250,000, while the fruit farm at Minnetonka, purchased for \$2,000, could be sold now for \$50,000. If anyone can show anywhere more profitable farming than that let us know where it is.

But the regents have not stopped even here. In their zeal to meet the wants of the farmers of the State, they have consented to impair somewhat the symmetry of the university, and have opened specially easy paths by which students can enter the department of agriculture, and they have done this by my advice.

When I came to the university, a little more than two years ago, I found one student registered in the college of agriculture. He graduated at the end of the year; and the second year of my administration opened without a single pupil in agriculture. You will believe me, gentlemen, when I say that I pondered upon the subject long and earnestly. I became satisfied that two things were clear: First, that the actual demand for special education in agriculture was very slight, as shown by the fact that in a great agricultural State with its tens of thousands of farmers, not one farmer's son appeared to ask for instruction in agriculture, while hundreds of farmers' sons and daughters came to the university to ask for instruction in other things. Second, that the children of the State who desired education at all would take the highest education that they could get. If, therefore, they once fitted themselves in the high schools to enter the regular courses of the university, they would keep on as long as they could in the lines of their preparatory work in the schools — that is in languages, mathematics, and mental, physical, natural and economic science. In the full tide of successful and joyous scholarship, with its almost infinite possibilities for the future, very few students would ever wish to turn aside to study

practical agriculture. Under these circumstances, I thought I saw clearly that either there would be no students in agriculture, or some special inducements must be held out for persons to take that course. As we would not divert any of the stream of students pouring into the university into the college of agriculture, the only thing to be done was to tap the stream nearer its source before the current set too strong in the present direction; and this we did. We have opened the doors of the college of agriculture to students who would not and could not enter the regular courses of study as heretofore guarded. We have provided that students may enter the college of agriculture upon passing an examination in geography, United States history, arithmetic, English grammar and composition—five of the eleven subjects required for admission to the other departments of the university—and as a result we have this year four regular students in agriculture, not one of whom could have entered under the old arrangement.

But for the agitation of the question of separating the college of agriculture from the university, I have good reasons for believing we should have had five times as many. So long as this agitation goes on it is impossible to work with the confidence in the future necessary for the highest success; and no special efforts, beyond a statement of the facts, have been made to secure pupils for this course the present year. If we are permitted to go forward with our experiment, I do not doubt its success. I am certain that our present plan of starting the agricultural department lower down in the course of study than heretofore is the correct one. I am confirmed in this by the deliberate judgment of Prof. William H. Brewer, professor of agriculture in Yale College; and I am confident that our present plan will commend itself thoroughly to every intelligent and fair-minded farmer who will examine it. Under this plan the studies pursued by the agricultural student to enable him to graduate as a bachelor of agriculture are the following: Agriculture, horticulture, botany, chemistry, agricultural chemistry, natural philosophy, anatomy, physiology and hygiene, entomology, geology, mineralogy, practical mathematics, drawing, algebra, geometry, trigonometry, surveying, shop work, history, zoology, English political science, veterinary science and rhetoric. I submit that the student who does good work in all these branches fairly earns his degree; and that the University need not be ashamed to confer a degree for this work, nor the student be ashamed to receive the degree which represents this work.

The regents have thus made it possible for any farmer's son who has a good common school education to enter the college of agriculture. Besides this they permit him to take any studies in the other departments of the university for which he may be fitted and which he may desire to take. Is it possible to make the situation more comfortable or more inviting for the farmer's boy than it is? If so, will you, gentlemen, please to tell me how?

But the regents have not stopped even here. Determined, if possible, to make the farm of service in the way of education, they last year authorized the formation of a class in "practical agriculture" to be composed of boys who pass no examinations and who receive pay for the work they do. Ten boys were in this class last summer. It was an experiment to see what degree of eagerness would be shown for practical education so much demanded. It is plainly not the kind of work for the university to do, but the experiment has answered its purpose. Meanwhile to fully carry out the design of Congress passing the agricultural land grant bill, the regents have done all that lay in their power to perfect the organization and equipment of the college of mechanic arts, all of whose privileges, instruction and apparatus are at the service of the students of agriculture, if desired. A visit to the new building, an examination of the machinery and apparatus, even a slight observation of the work done there, and an examination of the regulations for admission will show most clearly to anyone that the regents have been most faithful to their trust and have made most ample provisions for the education of students in the department of mechanic arts, while they have not made it difficult for the people intended to be benefited to enter the institution. I can not go into particulars at this point as I should like to. All I can say now, is, come and see the building and equipment for the college of mechanic arts and judge for yourselves.

Finally, as the mountain would not come to Mahomet and therefore Mahomet went to the mountain, so the regents determined that if the farmers' sons would not come to the college of agriculture, the college of agriculture, in part at least, should go to them. Farmers' institutes were accordingly established and more than thirty of them have been held. They have done good. But they can be made much better and more helpful even than they have been, and in a practical way can accomplish more for farming than anything else that can be done. I have no doubt

that they will be heartily sustained by the farmers of the State, and as a result I have no doubt that hundreds of farmers' sons will be induced to seek further knowledge in the college of agriculture, while thousands of farmers who know nothing about the technicalities of science will grasp the practical conclusions and apply them successfully to their farm work. If a farmer knows that by increasing his expenditure twenty per cent in a certain way he can increase the product of his farm fifty per cent, he can work out the problem, successfully, whether he knows how to analyze his soil or his fertilizers or not. But while great practical good can be done by the institutes under the direction of the college of agriculture, the real work of the college, the education of students, must be done at the university. If the farmer boys will avail themselves of the opportunity offered and enter into the regular work of the college of agriculture, I promise them an education that will fit them to be not only good farmers, but good and influential citizens of our republic. That, gentlemen, is the present situation so far as the college of agriculture is concerned and so far as it relates to its provisions for agricultural education. We are making an experiment, and if we are permitted to go on without disturbance I believe the experiment will be successful. And if it is successful it will save the State from further temptation to multiply colleges and unnecessarily to duplicate the agencies for education.

It is claimed by those who insist that the agricultural college should be separated from the university that no college of agriculture connected with a university has educated any considerable number of agricultural students, while colleges of agriculture which are separate have educated a large number. An appeal is thus made to experience. I am not a little surprised that gentlemen as intelligent as many of those are who advance these arguments should be deceived by mere names. You can call a theological seminary an agricultural college if you please, but that does not make it one. You can call a common school, or even a high school, a college, but that does not make it one. You can call a high school or college for general education with an agricultural attachment an agricultural college, but that does not in any just sense make it one. Suppose, for example, that to-morrow the legislature of Minnesota should vote to change the name of the University of Minnesota and to call it the Agricultural College of Minnesota, what would be the result? We should go on with our work just as we do now. We should en-

deavor to give our students a good education. We should train them in the same subjects we are teaching now. The larger portion of our students would then, as now, take the scientific course, and in that course they would learn those sciences upon a knowledge of which, in some measure, success in agriculture depends. More than half of our students would thus be engaged in laying the foundation of a scientific knowledge of agriculture, just as they are doing now. The university would be an agricultural college—so called—with three or four hundred students, but not one more student would be studying agriculture than are studying it now. It would be a successful institution and would have scholars and would be referred to as what a success a separate college of agriculture could be made, while, in reality, its success would not be owing in the least to its being an agricultural college in any just sense, but to its being a great deal more than an agricultural college. Its students would be there to gain general knowledge and not mainly to study agriculture. And I assert, without fear of successful contradiction, that wherever a so-called successful agricultural college exists in this country to-day the thing which attracts students to it is not the fact that it is agricultural, but the fact that it is a great deal besides that and the further fact that it is possible to enter this agricultural college—so called—with much less preparation than would be required to enter institutions that do not call themselves agricultural.

Take, for example, the Iowa State Agricultural College at Ames. Its faculty embraces professors in ethics, psychology, the history of civilization, English, Latin, history, mathematics, political economy, pathology, histology, therapeutics, comparative anatomy, civil engineering, mechanical engineering, chemistry, zoology, physics, astronomy, elocution, rhetoric, drawing, painting, music, besides those strictly agricultural.

I think I am correct in saying that the annual expense of the college is greater than that of the whole University of Minnesota. And the requirements for admission to the freshman class of this college at Ames are substantially the same as for our sub-freshman class in the agricultural course, and not equal in amount to half the requirements for admission to our subfreshman class in other departments. In other words, a boy who could not pass the examinations to the upper classes of a Minnesota high school can enter the freshman class of the Iowa agricultural college with its twenty-seven professors and instruct-

ors. Is it not easy to see why students go to an agricultural college under such circumstances? It is a new process of getting a high education—going to college without the trouble of fitting for college. What is the use of cheating ourselves in this way by calling things by their wrong names?

Then there is the agricultural college at Brookings, Dakota. I have heard it repeatedly referred to as a triumphant proof that a separate agricultural college would succeed when one connected with a state university would not, because, forsooth, there were two hundred students at Brookings, presumably agricultural students, while we had next to none in our college of agriculture in Minnesota. But I had an interview with one of the gentlemen engaged in managing the so-called agricultural college at Brookings, and I received new light on the matter. Of the two hundred students only three or four were studying agriculture at all. The rest have rushed into Brookings as they would to any other place where a better school than could be found at home was established, and they are going to school at Brookings with no more special thought of agriculture than have the boys and girls of Minnesota when they go to a high school or a normal school, or a college or university not agricultural. The agricultural college of Mississippi, so often referred to as having large numbers of students, has a plenty of students for the same reason—the absence of other desirable institutions of learning. Even at Ames agricultural college, I have been grossly misinformed if a large majority of the students do not take special pains to emphasize the fact that, though in an agricultural college, they are not agricultural students.

Now the simple fact patent in all this is that just so far as an agricultural college gives a good education in things generally, while at the same time it is easy to enter because the requirements for admission are low, it will have students. It is not in other words, agriculture, nor the desire to study agriculture, which controls the large majority of students who go to agricultural colleges; it is education in its wide and real sense, the desire to get this education if possible and the feeling that if they get it at all they must go where they can enter.

Now this education in its fullness, in better form and with more thoroughness than any agricultural college can possibly give it in Minnesota for years to come, we are actually giving all the time in the university.

We offer it, including instruction in agricultural science, to

all who are ready to receive it. Whose fault is it if the majority of students choose to graduate as bachelors of science with the scientific knowledge required in agriculture, and not as bachelors of agriculture, without the linguistic and mathematical knowledge which all students need? Are not these students wise in fitting themselves first for influential citizenship? And what possible use can there be in multiplying colleges, when we already have all that the work to be done requires? Gentlemen, I will be perfectly plain, even at the risk of incurring your displeasure. There is no need of a distinctively agricultural education so large as to make work for a separate college. Strip these agricultural colleges of the subjects which every high school or college, not agricultural, must teach and does teach, and what a miserable skeleton of a curriculum or course of study you would have left!

One great danger, and one that, as a state, we ought carefully to avoid, is the unnecessary duplication of educational institutions for the same work. The university and the normal schools ought not to do work which the high schools can do. It has been necessary in the past for them to do some of this work, but they ought to relinquish it just as fast as the high schools become able to do it. They are moving now in the right direction, and soon, it is to be hoped, that the university will do only proper college work, and the normal schools will be largely relieved of grammar school work, and will do their proper work more exclusively—the fitting of scholars to teach. So, to maintain two universities or colleges, having essentially the same course of disciplinary studies, and differing only in that one has a special trend towards agriculture, is a waste of the public revenue, and ought not to be thought of. And I go further than this. If we are to have a university worthy of the State, we must make it the seat of *all* the higher learning fostered and maintained by the State. If a school of mining and metallurgy is needed, it should be at the university. So of every other special school in the interest of the higher education. For all these the library of the university, like the heart in the human body, can serve to send life to every part. Laboratories, collections of specimens, museums, all can be made serviceable without additional expense, as could not be the case if a school of mining is to be in one place, a school of botany in another, and so on. It is by concentration at one point, of the educational forces and material, and not by separation and a weak duplication of forces,

that great universities are built up. Surely we are in sufficient peril from the multiplication of colleges here, without the State adding to our peril by adopting a policy of division and weakness.

The one science which, more than all others, is especially serviceable to agriculture is agricultural chemistry, using this term in its widest sense, as embracing the whole science of vegetable and animal production. As the object of agriculture is to "raise from the soil as large a quantity as possible of useful vegetable products, or indirectly, of animal products," it is very evident that the farmer who does anything more than in a blind way to trust to nature for his crops, must understand the composition of plants, of animals and of soils. True, very many men without scientific knowledge succeed as farmers, because by experience and observation, their own or other people's, they have reached substantially the same conclusions as those reached by science. But if boys are to be *taught* how to become good farmers, — better farmers than their fathers, — it must be by the scientific training, and not merely by experience. Now for this scientific training in agricultural chemistry — the most important — the all-important scientific subject, what need of a separate college, with its new buildings, new laboratories, new library, new apparatus and material, and new professors, when now, *as things are*, without a dollar's additional expense, the whole science of agricultural chemistry can be taught in our present laboratories, and taught, too, under the direction of a professor as accomplished as he is modest, a graduate of Harvard University, and a student in both England and Germany; when, too, a practical application of the principles of science can be made on the university farm, especially selected on account of its admirably diversified soil.

It is not because I happen to be president of the university that I oppose the establishment of a separate college of agriculture. The separation of the college of agriculture from the university would not impair the usefulness of the university in other directions, unless, indeed, the State, burdened with the support of two institutions, should withdraw its support from the university and thus stop it in its career of progress upon which it has fairly entered and to which it challenges attention. I do not understand that the most earnest advocate of separation desires to impair the power and usefulness of the university. But I oppose the establishment of a separate college of agriculture, as a

citizen of the State. I oppose it because it will involve a needless expenditure of money to establish it, and a much larger expenditure of money to carry it on every year than will be required for doing the same work in the university already established. I oppose it because it involves heavier taxes without corresponding benefits. I oppose it because it is unnecessary and if established will never accomplish what its supporters hope. I oppose it finally because we are in the midst of an experiment with the college of agriculture and it remains to be seen whether or not we can meet both the wants and the demands of the farmers. I have only to add that whenever it shall be proved that some other arrangement than the present will be more beneficial I for one shall heartily welcome the new arrangement.

It is a noticeable fact that in one particular farmers are unlike the persons engaged in most other occupations. While we find trades unions of every kind carefully guarding against an oversupply of laborers in their particular departments and so against too many apprentices learning the trade, farmers, on the other hand, seem to be anxious to swell the numbers in their own ranks and to be fearful not that too many boys will become farmers but that too few will do so. They seem to be annoyed that any other occupations than farming should prove attractive to farmers' boys. I do not quite understand the reason of this. It seems to be more a matter of sensitive pride in their own occupation than the result of any broad views of utility or of political economy. But be that as it may, I shall regard it as a sad day for the country when the ranks of the professions and of trade and of manufacturing and of banking can no longer be recruited from the sturdy and energetic and honest sons of farmers in the country. The best blood in all lines of activities in our large cities has come from the country and from the homes of farmers. Long may it be so; and far distant be the day when through any compulsion, social or physical, esoteric or exoteric, the sons of farmers shall be shut up to an education purely agricultural, and be forced, against their own taste and inclination, to follow the occupation of their fathers. As the mingling of nationalities and creeds and purposes and tastes helps the process of assimilation in our national life, so the mixing of families in different pursuits keeps all out of a rut, and adds to the life and activity of the whole. When, then, farmers complain that so many farmers' sons go into other pursuits than farming, they complain of what is for the best good of all concerned. What

we need to look out for is not lest farmers' sons should go into other professions, but lest farmers, whether the sons of farmers or not, should be uneducated and unfit for their work. And in this view of the case, so long as the sons of farmers can receive the benefits of the education in the State provided for the sons of all other classes of people, and can receive special agricultural education besides, if they desire it, I see no reason for sensitiveness on the part of farmers because they have not a separate college provided for the education of their sons, isolated and segregated from the rest of the people of the State. Such isolation, such education of a class of people apart from others is undesirable and would be unhappy in its results even to those for whose benefit it is sought.

I know that the problem of agricultural education is one of the most difficult of all educational problems, because back of it is a host of people who do not expect to go to the college for an education, and yet insist that in some way the college shall benefit them, help them to do better work and to get larger returns. How the wishes of this large class can be met, except by the publication of the results of experiments, by the holding of farmers' institutes in all parts of the State, and by the education of students who as practical farmers shall be examples of skilled workers in agriculture, I do not at present see. If there be other practicable methods, I am not unwilling to recognize them, for no one, I am sure, can more heartily desire to do all in his power to promote the interests of agriculture and of the farmers of Minnesota than I.

Gentlemen, we must have certainty and stability in counsels in order to insure the successful progress of educational work. We can not plan wisely and put our plans into execution energetically if it is to be a matter of uncertainty every time the legislature meets whether we are to continue in existence as a university or are to be mutilated and shorn of some of our departments. We are doing well at present, but we can not rest on what we *have done*; we can not be content with what we are doing, without rapidly falling behind our sister states. The noble science hall, just built by Kansas; the \$200,000 appropriated by the last legislature of Wisconsin for a fire-proof building to replace the science hall consumed by fire; the liberal appropriation of Nebraska for the department of botany, as well as for others; the steady onward march of Michigan's great university, all warn us that a liberal policy towards the univer-

sity of Minnesota is necessary if we are to maintain the honorable reputation we have won, or are to keep pace with the education of our neighbors.

The state of Minnesota has many things of which she may justly be proud. Her territory is a royal domain of magnificent proportions. Her soil is of surprising fertility; her climate is most invigorating. Her people are enterprising, enthusiastic, united. Her rapid progress in material development, in population, in wealth, commands the attention, the admiration, the wonder of the whole country. Beyond her is a territory stretching from the Mississippi to the Pacific, the future home of millions, whose wealth will pour itself an endless flood into her borders. The State so great in material resources is hardly less great in her liberal provision for education. She ought to feel pride in her highest institution, her university. What, then, shall the University of Minnesota be to the state of Minnesota? Shall it be a real university, or shall it be dismembered and divided one part here and another there? Shall it be a university or a confederacy of high schools? Shall it be to Minnesota what Harvard University has been to Massachusetts, Yale to Connecticut, and Princeton to New Jersey, the university of the State and thus of national reputation, or shall it be *one* of the universities of Minnesota and so unknown beyond the State? It is not the university of the regents who govern it, nor of the faculty who teach in it. It is the university of the state of Minnesota. To the state of Minnesota, therefore, I look with confidence for such wise and liberal action as shall preserve the university from mutilation, shall enable it to keep abreast the age in its learning and teaching, and shall make it an institution where all sound learning may be gained, where the rich and the poor may meet together on equal terms and may secure an education good enough for the highest while not too good for the lowest. And for the accomplishment of this I appeal to you, gentlemen, as intelligent members of the most powerful body of workers in the commonwealth, to give it your hearty and effective support.

On motion the speaker was given a vote of thanks for his able and interesting address, and it was ordered placed on file for publication.

DISCUSSION.

Mr. J. M. Smith said he had been assisting in the management of fairs for twenty-five years past and would like to ask Mr. Gregg a question about their management. He had spent much time considering the matter of horse racing at fairs, the awarding of premiums, etc. Teaching a horse to trot was no worse than to teach him to draw a load and anyone would prefer a fast horse to a slow one; some things incident to horse trotting at fairs were to be deplored, but which seemed almost inseparable to them. While managing a certain fair in Wisconsin he had determined to have some honest horse trotting, and he had informed a certain man of his purpose in that regard, asking him to take charge and give them some good, honest trots. The gentleman looked at him in a calm way and said: "Do you ever expect to have an honest horse trot?" There was no such thing as honest horse trots, the drivers would make up some scheme to have their own way about it. The managers could not banish pool-selling entirely. Their Wisconsin agricultural society received \$4,000 a year from the State; county societies two hundred dollars each, provided no games of chance were allowed and certain other requirements complied with; this was having a very wholesome effect upon the character of their fairs.

Mr. Gregg favored employing honest drivers at fairs instead of jockies. He hated to see a horse brought upon the grounds weighted and strapped criss-cross, with the whipping, swearing and making things look "blue" generally. Speed was dependent upon form and not on strapping and rubbing. A horse that had been well bred loved to trot and to make his time as a bird loved to fly, and he believed that honest drivers could be had; let them be had, let them be paid, and let a premium be placed on honest driving.

Mr. J. M. Smith thought the responsibility for all this gambling and liquor selling on fair grounds should be taken from the managers by being prohibited by law.

Mr. Harris said he had been for several years past on the board of managers of the State Agricultural Society. Six or eight years ago the board was nearly a tie, but a majority were in favor of abolishing liquors of all kinds from the grounds. This last year the board took no action as a board, the matter of privileges being left to a committee; the result was liquors were sold at the state fair.

President Elliot said there was a bill now before the present legislature to reorganize that society, and hoped the present Agricultural board would have these matters in mind and try to bring about a wholesome change in the desired direction.

On motion the meeting then adjourned till 9:30 o'clock Thursday morning.

MORNING SESSION.

THIRD DAY, THURSDAY, JAN. 20, 1887.

The meeting was called to order at 9:30 o'clock Thursday morning by President Elliot.

The following communications were read:

FROM RUSSIA.

ST. PETERSBURGH, Aug. 21, 1886.

S. D. Hillman, Secretary, etc.,

DEAR SIR: Please accept my best thanks for the transactions of your Society, that you have had the kindness to send me. I have read the papers and discussions about the Russian apples with great interest, and have the intention to prepare a paper upon this subject, with the intention to attract the attention of our fruit growers to the intelligent labors of the members of the Minnesota Horticultural Society to create a variety that could stand the cold and dry climate of your state. I mail you a report of our department of agriculture and horticulture, about the state of horticulture in Russia. It is written in Russian. If you wish to have an extract from it, I can make one in German and send you, knowing too little English to make it in this language. You can translate it from the German into the English. With great respect,

Yours,

G. DOPPELMAIR.

PETROSABODSK, GOV. OLONETZK, }
RUSSIA, Nov. 13, 1886. }

S. D. Hillman, Secretary, etc.,

DEAR SIR: Your welcome letter of the eighth of July received. Please inform me when your next meeting shall take place, and

I will, with great pleasure, send you a paper about our fruit varieties.

I have read all that was written about this subject by Professors Budd and Gibb that appeared in the transactions of the American Horticultural Society and in the report of your Society. I will try to give a sketch of our climate belts and the varieties that grow successfully in each of them, with the intention to give to your members the possibility to make an appropriate choice of varieties to be tried in their localities. You shall receive, in due time, a package of cions of hardy varieties, grown in a dry climate where —18° Fah. is not infrequent.

Mr. Baer, of Kremetsburg, has promised me to send a box with cions of varieties that I begged him to select, to Mr. W. H. Ragan, secretary of the American Horticultural Society, at Greencastle, and I have prayed Mr. Ragan to have the kindness to mail you the package that is destined for you, after reception of the full collection, that I have divided in three parts: one, Crimean varieties, for the South; the second, middle and hardy varieties for Wisconsin, and ironclads for your region.

I have seen here, under the 62° north latitude, apple trees in good condition, but I came too late to see the fruit upon the trees to pass judgment upon the quality of the apples. One that I tasted was sour; they nevertheless affirm here to have varieties that a more delicate palate can taste without making grimaces. If the assertions of the kozells of this place be true, here is the place to recruit ironclads. You may receive an idea about the climate if I shall mention the fact that the lake of Onega is not free from ice before the end of May.

Wishing you to receive the cions in healthy and good state, after their long voyage, I remain, dear sir, with great respect,

Yours,
G. DOPPELMAIR.

FROM COLORADO.

BOULDER, COL., Jan. 17, 1887.

S. D. Hillman, Secretary, etc.,

DEAR SIR: Yours of late date at hand, also program; thanks for same. I send you to-day by express a few of our reports, also photograph of the fruit exhibit, with list of apples (fifty-eight varieties) shown at our December meeting, which was a very successful one. The interest in horticultural work in

Northern Colorado is growing, and our state has a bright future before her, as it is no longer a theory with us but a demonstrated fact that we can grow fruit. Our apples are very fine, and when grown in this high and dry climate they have fine keeping qualities. I remain yours, very respectfully,

C. S. FAUBOT.

FROM OHIO.

CUYAHOGA FALLS, OHIO, Jan. 18, 1887.

S. D. Hillman, Secretary, etc.,

DEAR SIR: I find myself unable at this time to send anything for your meeting. Perhaps the best service that anyone can render your Society now, is to induce the members to try the Jessie strawberry. I presume Mr. Kellogg will do this. I think it will supersede more varieties than any other ever sent out.

I think your people would do well to try the Jessica grape, too. It is early, hardy, and the best flavored white variety I ever tasted.

The outlook for careful, intelligent strawberry growers is encouraging. Horticulturists have been so free with their methods that many unskilled persons have engaged in raising small fruits, and there has been a surplus of inferior berries put on the market. Prices for such have been low, and many growers have been discouraged. Let careful growers do their best, and the business is all right. There's room at the top.

Yours, very truly,

M. CRAWFORD.

FROM WISCONSIN.

JANESVILLE, WIS., Nov. 23, 1886.

S. D. Hillman, Secretary, etc.,

DEAR SIR: Your letter of the twentieth duly received. I hardly know now whether it will be possible, profitable or expedient to attend your annual meeting, however much I should desire to do so and enjoy it on my part; but that I should add anything more than one to your usually large convention or to its interest, I have my doubts. With a program so large as last winter, I don't see how your president ever got through so much business in the time. If I had any suggestions, it would be to

cut all papers to fifteen minutes, and allow only the same time for discussion, and restrict speakers to two minutes. This will sharpen up the papers and debates. Let your program be as varied as possible, and not too many papers on one interest. I think tree peddlers ought to be raked over the coals again, and roast them worse than ever. "The Chain" gang that hails from Sparta, Wis., played a big game in Wisconsin, getting orders under false pretenses, and delivering from Ohio. They were badly baffled by the lights that emanated from our annual June meeting. Stir them up, and all other swindlers.

If circumstances so turn, I shall be happy to be at your meeting, but expect now to go as delegate to the Northern Illinois Horticultural Society, January 11th and 12th, at Kankakee. Perhaps President Smith will be all you can use from the Badger State.

With kind regards and great success attending your Society,
I remain very truly yours,

GEO. J. KELLOGG.

LETTER FROM OLIVER GIBBS, JR.

RAMSEY, MCCOOK CO., DAKOTA, }
Jan. 6, 1887.

To the State Horticultural Society:

Thanks and congratulations, kind greetings to old friends in the Minnesota State Horticultural Society. By request of your secretary a note or two from South Dakota.

As I write at nine o'clock this morning, the mercury lies quietly in the bulb. If there is any truth in the theory that it is the cold weather that kills our trees, this time

"The tyrannous breathing of the North
Shakes all our buds from growing."

But mark you, the ground did not freeze last fall till November. There was a moderate supply of rain just before the snow had lain well; there have been no sudden changes with wide range of temperature. Probabilities: trees that were healthy in November are healthy still.

Having been here but one year, and much occupied with home affairs, traveling little, observations are limited. Saw no fruit trees in bearing last fall; saw none large enough, though lots of small ones on various farms, tracks of the missionary.

Small fruits were plentiful. Heard a good deal of praise of the sand cherry, transplanted from the Big Stone River bluffs to gardens. Said to be prolific and of good quality. It is a low, almost trailing shrub, looks some like a dwarf willow. Have them in my garden, but did not see any fruit. Some of my neighbors had plenty. Think it worthy of general trial.

For the first time in my life I own a piece of land where the soil is good for anything, and elevations, exposures, etc., adapted to fruit growing. Had a good garden last summer. Nothing in it worthy of special mention except these: Cory sweet corn, earliest, and the best early sweet I ever planted; Black Mexican sweet, late but very prolific and good; Stokes "extra early" watermelon — not extra early, but the best melon to eat we ever had; small, but even sized and prolific and a good keeper; Ironclad watermelon, large, excellent for shipping; but for the most pounds to the vine, and of excellent quality, the Excelsior heads my list of eight varieties. Vick's Early yielded the largest specimen and a good one. All the rest on the vine inferior, and of mixed characteristics; Miller's Cream Nutmeg, a splendid sort; Bird cantaloupe, large, late but inferior quality. Seeds from Gregory.

I laid out a good orchard site last spring, and planted about two hundred and twenty-five trees, one hundred of them from the Jewell nursery, the rest, the best Russians I could get from Prof. Budd and A. C. Tuttle; among them, Antonovka, Yellow Transparent, Arabskoe, Anis, etc., of the apples, and the Bessemionka; number three hundred and forty-seven of the pears; Budd's Ostheim Cherry, several of his Russian plums, and the Wolf and Speer native plums. Next planted a few Rollingsstone plums from O. M. Lord, with Weaver's that I brought with me. Of strawberries I set out some varieties from J. T. Lovett; Gledale, Parry, Warren, Sharpless, Jewell, Triumph de Gand and Black Defiance. Old friends will smile to hear me confess I haven't got a Wilson on my grounds.

I live in a timbered gulch that runs east and west a mile on the north side of my farm, and has thousands of wild plum trees in it. I put in the most of my time last winter trimming these plum trees and grubbing out a good many that were in the way. Didn't seem to "set much store by them," but after the fruiting season came on in the fall, I found we had a bonanza in wild plums; there were about fifteen distinct sorts that were excellent for hand eating or cooking, several of them freestones.

There are two or three sorts that promise to excel any that I have yet seen of the native, propagated in nurseries. One very large, my wife calls the Wild Damson; another of the form and quality of the De Soto, is larger and a perfect beauty in color and finish. There are whole thickets of one kind, few trees bearing inferior fruit; these I shall grub out, encourage the good ones and then crosses, and hereafter think as much of my plums as of a peach orchard. Have planted a lot of pits from the best ones to get a seedling plum orchard. Some of the best sorts are in a pasture where I have to let my cattle run. They will not file their horns any more on plum trees or trees of any other sort, for I have taken their horns all off, and I shall not let any more grow on the farm. If this does not protect the trees, the bovines will get fenced out of the gulch.

Hope you will have a pleasant meeting, lots of fruit and garden truck on your tables, a rich program, and all things else needful to prove to the governor and legislature that you are spending the state appropriation to the best good of the public for whom you work. You have a good secretary. Cherish him.

OLIVER GIBBS, JR.

On motion of Mr. Harris, Mr. Gibbs was made an honorary life member of the Society.

Mr. Sias said the sand cherry referred to by Mr. Gibbs, was hardy on his grounds, the plants being two and a half to three feet high; they had blossomed, but as yet borne no fruit. It was a native of Dakota.

Mr. Brand had experience with the sand cherry some fifteen years ago. He saw an article in the report of the department of agriculture some twenty years ago, calling attention to the "Dwarf Rocky Mountain Cherry;" and he had paid twenty-five dollars for a quantity of the plants. They proved to be identical with the sand cherry and were good for nothing; they were hardy enough but the fruit was worthless.

Mr. Harris gave notice of proposed amendment to the constitution of the Society authorizing life membership fees to be paid in two annual payments of five dollars each.

The annual report of the Secretary was then read.

SECRETARY'S ANNUAL REPORT.

Mr. President and Fellow Members:

In presenting this, our second annual report as Secretary of this Society, it gives us mingled pleasure and delight to meet again with friends and fellow members, to carefully consider and discuss the varied interests we represent and add our mite towards the sure and steady progress, as well as permanent advancement of the horticultural interest of our commonwealth. Again are you to be congratulated for measurable success, prosperity and happiness, attendant on the labors of the months which but too quickly have been numberd with the past, but which have doubtless yielded golden fruitage for earnest effort, thought and toil, which may have been, perchance, with willing, hopeful hand bestowed.

In glancing back upon the few brief months, since our last annual session, we gather many pleasing lessons from the past and find good cause for taking courage for the future, which still is lying just before our reach, but which is constantly unfolding every hour.

THE PAST YEAR

in some respects, at least, has been a prosperous one. Our crops were reasonably abundant, although the prices realized have not been so remunerative as was to be expected; but while much better have been known in other years, compared with other sections of our land, the net results, we think, will average fairly well. Our fertile soil has yielded ample tribute to the thoughtful, patient husbandman, and few complaints are urged in this regard, no matter how severe may be the pressing weight of competition, or how discouraging the crushing load which capital with its monopolizing hand may struggle to impose.

THE WEATHER SERVICE.

Some interesting facts are to be gathered from the statistics furnished by our signal service and by comparisons with other years, regarding certain meteorological changes taking place from time to time. This surely is a most inviting field for thought,

with horticulturists especially, since it is well for them to fully understand all the conditions of success. The sudden changes in temperature, and marked extremes of heat and cold, experienced here, are often quite disastrous to our orchard trees, as well as to our vines and other tender plants. Perhaps this is the greatest obstacle in the way of growing hardy, winter fruits. Last winter was not so severe, (at least for fruit) as usual. Although we had much steady cold, as well as frosty weather, still as a rule the temperature was more equable and mild compared with that of the preceding winter of 1884-5. Here at St. Paul, the mean temperature in January was colder by one-half degree than the preceding January; but the thermometer failed to drop as low by two degrees, and did not go above the freezing point while in that month in the preceding year the range was very great, as for example, January 2d, was 36° below; the 5th, 46° above; then down again to freezing on the 7th, and on the 8th to 46° above. The mean temperature in December, 1885, was 4.1°; of February 1885, 9.9°; of February 1886, 15°.

THE SEASONS. •

Spring opened somewhat earlier than common. The warm, dry weather which ensued was favorable for outdoor labor, and farmers eagerly improved the time in putting in their wheat and other grain. The copious showers of rain which followed later on, were very timely and rapidly brought forward vegetation. The cereals of every kind were given a good start, the grass afforded pasturage in excellent quality and abundance, the hay crop therefore being good, as well as that of grain.

The most remarkably dry season which prevailed to a considerable extent throughout our summer months was not particularly severe in Minnesota; at least in any sense which might be deemed disastrous to growing crops, or causing serious inconvenience to those who cultivate the soil. The serious injury to crops from drought experienced elsewhere, and notably in portions of the states of Iowa, Nebraska, Kansas, Indiana and Illinois, was quite unknown to us. And this affords a striking instance of the "staying" qualities of our soil, as being of a nature which enables it to quite withstand such trying tests as these, of long continued drought, without much loss to growing crops of any kind. In many instances, in fact, it has been found that yields of grain were larger and of higher grade than have

been raised in other seasons when there was greater moisture. And this is certainly a fact which should not be forgotten, nor soon be overlooked, as it is good and satisfactory evidence of the superior nature of our soil, which may be mentioned to our credit, in common with the well known healthfulness and equality of our climate so well and universally known and recognized by all. As emphasizing somewhat on this point we cite the splendid products of the garden and the field, of vegetables and grains of every kind, as witnessed at our state and county fairs, and ask those interested to note the happy contrast in our favor to be seen, compared with the productions shown from regions further south and east. We think this picture is in no sense overdrawn and that our claims will more than be sustained in setting forth to all the inherent excellence, fertility and permanency of our virgin soil. This is, of course, the standard of our faith and why we challenge the attention of the outside world; and this is why, perhaps, so many sturdy, honest immigrants are constantly inquiring after farms and homes within our State; and furnishes in part the secret of that measure of contentment and prosperity that almost everywhere prevails. And you will pardon reference here, which shall not be indulged beyond the mere suggestion, to point with a becoming pride and satisfaction, which all can surely not but recognize and feel, at the unparalleled developement and growth of Minneapolis and St. Paul, the dual cities of the great northwest!

Now, after this digression, we premise further that in offering such suggestions as may seem of more especial interest to the cause in hand, we wish to briefly call attention to those matters which may be of especial interest to members of our own Society as well as those who are in general desirous of promoting horticultural progress everywhere. For lack of time we can not enter into any lengthy disquisition concerning subjects, which are mentioned here, or incidentally alluded to as proper matters for your own consideration.

AS TO FRUIT.

The season, as a whole, has been a fruitful one. Our orchards have produced abundant crops of fruit. Trees which survived the trying ordeal of a previous winter were laden heavily with fruit, although the number of the orchards yielding largely, in the State, are few and far between. There are too many in-

stances, in fact, where young and vigorous trees have been well nigh destroyed, and made more fitting for a heap of brush than bearing heavy loads of ripe and toothsome fruit. Our thoughtful orchardists are not dismayed at this, as yet. Not quite disheartened at the amazing havoc wrought by our late "trying" winter, they seem determined still to persevere and fully test the question whether we can grow that best and fairest fruit of fruits, which tempted, it is said, our Mother Eve to lead the race astray!

The hordes of insects which infest our fruits and usually are so destructive, were said to be less numerous than heretofore, and there was not the same amount of injury from codling moth as commonly has been experienced, nor has there been so much complaint of rust and blight, and kindred maladies that might be named.

The drought of summer shortened up the berry season and ripened small fruits quickly, although there was a fair and average yield. Strawberries ripened fully two weeks earlier than usual, while most of the delicious fruit produced was very large in size and fine in flavor.

HORTICULTURE

in its broader sense has reference to investigations into scientific modes and methods to be followed and observed by those who seek to be its votaries. Its elevating influence as an art is known and freely recognized, and tends to the promotion of the nobler aspirations of the mind and heart. The laws that govern plant and vegetable life are varied in their nature, yet full of profitable and instructive lessons. Associations which attend the dressing of the vine, the culture of the choicest fruits, the care and close attention to the growth and cultivation of the fairest flowers, which in its laboratory so abound, must necessarily be calculated to promote æsthetic tastes, and tend to cherish admiration for the beautiful and good. This is a proposition it seems to us so palpable to all as scarcely needs the weight of mere assertion, or argument of any kind.

The question has been often asked, why are not more engaged in growing fruits? From lack of thought, or lack of zeal, this industry is surely much neglected. With some the lack of profit is a cogent reason, and this indeed with many is perhaps the gravest question of them all. Just how to make the business

pay is the absorbing, all important point; too many seem to think the only thing to be considered. It would appear to be high time for farmers generally to understand and realize that they must grow their own supplies of fruit, or very largely go without this priceless blessing, which should be shared by rich and poor alike. Good fruits are easily produced when proper means are brought to bear.

THE INDUCEMENTS

offered to the horticultural laborer are many and of a varied kind. This avocation should go hand in hand with that of agriculture and supplement the labor, energy and skill which usually afford such fair returns for time and money thus employed. No prudent farmer should dispense with shade and ornamental trees about his yards, or be without some method of protection for his stock and growing crops; his garden should be well supplied with small fruit products, and vegetables of various kinds; his orchard should contain at least some of the hardiest kinds of standard fruits—some such, for instance, as the well-known sorts our honest nurserymen will recommend; and more than this, he may and should produce each year, a tempting crop of grapes, sufficient for his own demands at least, and some to spare in case of sickness, or adding to the comfort of a well-deserving friend.

We hardly need to call attention to the excellence of Minnesota horticultural products since their merits are so well and generally understood. For flavor, quality and beauty, our fruits are unsurpassed. The numerous awards of merit given to our own Society in the past, where large exhibits have been made and closest competition has been had, attest this very fact, and are among the strongest proofs that we may safely challenge almost any section of the land to make displays of fruit of finer quality than we can here produce. It is well known that southern fruits are not so highly flavored or as good as those produced in colder latitudes; and like the human race on southern soil, are apt to soon to degenerate, to some extent, at least. In saying this we do not wish to make invidious comparisons by classing tart and acid fruits with "sharp" and tonguy men; please draw your own conclusions without extenuation.

THE PROGRESS MADE,

as well as the increasing interest shown, in the advancement of the cause of horticulture in general throughout the State, is, we may say, quite marked and most encouraging in fact in every way. There is much seeking after information of modes and methods to be used, varieties to plant, establishing associations and farmers clubs, with other evidences that might be named, which clearly show awakened interest and progress being made, of a substantial kind. Low prices which obtain for staple products of the soil, of corn and wheat, of live stock, butter and the like, may tend in part to bring about this change. The area planted out in strawberries is rapidly increasing year by year and this department is alone becoming quite a leading industry in this immediate vicinity, at least. The same is true of grapes as evidenced by numerous vineyards springing up, producing large and paying crops, and free from rot or mildew, though grown entirely in the open air; the area planted, it is said, has fully doubled in the past two years.

No danger yet seems apprehended that work in this direction will soon be overdone. There may be need of some protection for home-grown fruits; our markets should not be established and controlled by those engaged in the commission trade, nor ought we to be left entirely at the mercy of the foreign shipper. Some method ought to be devised whereby producers might receive an adequate return, at least to the extent that they might sell their products on an open market as well as on their real merits. Perhaps to some extent there may be cause for censuring ourselves in this regard; and should there not be some co-operation among the growers of fine fruits? Fruit growing as a business will not yield a fair return without intelligent and due regard to necessary duties, attention, care and skill, in everything required. Our soil and climate must be understood; our changing seasons, heat and cold; the mode of growing hardy stock; effects of drought and moisture; the various kinds of plant disease; all these must be considered and the best and wisest means employed, in order to ensure the proper measure of success. The merits of the newer sorts of trees and plants should be discussed and carefully considered before discarding those varieties which have been found to be of value in the past.

THE COMPETITION

in the market as to fruits is frequently a serious question. Large stocks are shipped here from a distance just at the time when home-grown fruits are ripe, and hence we come in competition with the foreign shipper; the prices are reduced in consequence, the profits are confined to narrow limits, if actual loss indeed is not sustained. We cite, in this connection, the experience of a small fruit grower at Rochester, in this State, who raised this season 35,000 quarts of strawberries, some of his grounds producing more than three hundred bushels to the acre. With this enormous yield he finds the business hardly pays a fair return, in consequence of foreign competition. We can not hope to cut off competition wholly, but may we not be able to control the market, more or less, by striving to produce and offering for sale the very best and choicest stock? A first-class article is in demand and always brings the highest price. If we can grow the finest fruit why should we not receive the highest price?

THE APPLE QUESTION.

Perhaps no subject is presented at our annual sessions possessing greater interest than this, or one more calculated to provoke the liveliest discussion. There is in fact no more important subject for consideration at our hands, because the question of our ultimate success is still so problemetical. And hence the subject will in various aspects be considered at this meeting.

The seedling question has received attention from those composing the commission chosen for the purpose of making personal inspection of hardy, seedling trees, and their reports will prove most valuable to all who seek for information as to native seedling fruits, as well as other matters dwelt upon.

Prof. J. L. Budd, in his last annual report, as secretary of the Iowa State Horticultural Society, says: "On ordinary prairie soils over an extent of the West equal to half a dozen of the small kingdoms of Europe, the home and commercial orchards are killed, or hopelessly crippled, to an extent not known in the history of this country or any other. Timber soils have not sustained their reputation as favorable orchard sites in Iowa, Indiana, Wisconsin or Illinois. Even so far south and east as Lafayette, Ind., the fine young orchard on the grounds of Purdue University has been grubbed without the reservation of a single

tree. Yet it stood on hard-maple land, which has been hitherto thought favorable to the apple and the cherry."

He further states that the injury to the varieties called hardy "was not in the tops;" that trees top-worked on hardy stock were comparatively unhurt, whereas the same varieties root-grafted failed to show a perfect leaf. He cites the further fact that apple trees which have succeeded best on varied soil and over wide areas of the West, have been from Russian or from crosses of Siberian stock. He thus concludes a somewhat lengthy statement on this subject here considered: "We absolutely can not expect to produce a seedling hardy enough to endure our test winters when in bearing, unless it shows in leaf, bark and wood cell, its descent from the crabs, or the Russians, and I do not hesitate to say that the sweepstakes premium winter apple of our society will not come from a crab seed."

THE RUSSIAN QUESTION.

We note that our Iowa friends are not as yet in full accord upon this subject. In this connection we cite the following statement of a leading fruit grower, at the Iowa meeting just referred to, that of C. G. Patten, of Charles City, who says: "The coming apples of the Northwest, in my opinion, will be the seedlings we originate on our own soil and in our own climate. If we go at this work methodically and vigorously we will secure the varieties we need sooner than we can sift the great list offered us from Russia."

In a recent letter received from Prof. Budd he says: "This Russian fruit question has several aspects. In the north half of Iowa the old list dropped down to Duchess, Tetofsky and Wealthy. I believed six years ago, and am stronger in the belief now, that East Europe had many varieties of really good apples for all seasons, and many sorts of pear, cherry and plum, which would give perfect satisfaction in the north half of our state and some of these in your State and the north half of Dakota. * * * We keep a careful ledger account with each variety sent out, and some of our friends who scold at the meanest of the varieties in quality, such as the Hibernial, Lieby and Silken Leaf (No. 327 of department list), will be surprised if they spend a day looking over the reports from our many sub-stations in regard to the perfection of tree and quality of fruit of very many of the new comers from East Russia."

As is well known the list of importations made by the agricultural college at Ames, comprises several hundred Russian sorts.

The action take by our Society one year ago with reference to Russian fruits, consisted in the recommendation of the following varieties for trial, to-wit: Ostroloff Glass, Hibernial, Red Cheeked, Red Anis, White Pigeon, Autumn Streaked.

So far as Minnesota seedlings were concerned, there was no action taken, at least no new variety was named as being better than our well-known Wealthy. It may in fact be questioned whether we shall soon discover a larger seedling winter apple, possessing greater merits, especially when hardiness, fine quality, and beauty of appearance are considered. It might be well, however, for this Society to follow the example of our Iowa friends in offering liberal premiums for hardiest and best varieties to be grown and propagated in the future.

Prof. Budd has ventured the opinion that "an apple tree that will endure our test winters well must maintain perfect foliage during our hot, changeable summers and must be as determined in habit of ripening its wood as the box elder or hickory; it must have a bark that will not absorb water readily in wet times in autumn or early winter; it must hibernate in winter and have a cell structure practically incapable of freezing."

At its last annual meeting of the Iowa State Society the list of apples recommended for the northern district, which comprises forty-two counties of that state, was as follows: Duchess, Wealthy, Whitney and Tetofsky; for trial, Walbridge, Fameuse, Gros Pomier and Talmon Sweet.

At that same meeting Mr. Speer, of Cedar Falls, supplemented this report by saying: "I believe that many Russian varieties now on trial will prove valuable to us, but it is useless to recommend them now for general planting. There is no available stock on hand, and if we single out a half a dozen, or a dozen, which we now think most promising, every tree peddler will be hawking them over the whole district in less than a month after the list is published. The real and tangible fact is before us, that aside from the varieties recommended, our apple trees of the North are dead or dying."

There can be little doubt that Russian fruits are gaining steadily in favor, especially with many leading orchardists. We close our notes upon the subject with an extract from *Rural New Yorker*, from the pen of Dr. T. H. Hoskins of Vermont:

"I have fully one hundred varieties of Russian apples growing

in my grounds, many of the trees being sixteen and eighteen years planted, while some, of the later importations, are small. One thing is fully demonstrated, viz., that these apples are, as a class, very much hardier against adverse climatic influences and especially against winter's cold, than those previously grown on this continent. This alone gives them enormous value for the 'cold north,' where, without them, tree-fruit culture would be impossible. In productiveness, size and beauty of fruit, the Russian apples are, on the average, more than a match for those of Western Europe, and for our native seedlings thence derived. Those who have an extensive acquaintance with Russian apples know that there is among them quite as large a proportion which deserve to rank as of dessert quality as there is among the common sorts. Among these fine dessert apples the Yellow Transparent, Grand Sultan, Switzer, Charlottenthaler, Berkoff, St. Peter, Longfield, Golden White, Streaked Red, Summer Calville, Noble Redstreak, Russian Gravenstein, Red Anis, Titovka, White Russet, and several others have now been sufficiently tested to establish the fact of their excellent eating quality, joined, in most of them, with great beauty of form and color."

HYBRID VARIETIES.

Much has been said in favor of the propagation of crabs and hybrid stock; they are admired by some for hardiness, productiveness and thrift in growth of tree. But there are certain reasons why their cultivation largely in our soil and climate should not be strongly urged. Transcendent, Early Strawberry, Orange, and a few other kinds, do fairly well as orchard trees in some locations. In this connection we may cite the experience of Prof. Budd who states that he gathered on the Collage Farm some sixty varieties of crabs and crab hybrids, six years ago, and the most promising of these were sent out for trial; that only six or seven of this number now are left, similarity of size and quality, and their peculiar tendency to blight having consigned them one after another to the brush pile. Of the number left he mentions Sarnia, Gibb and Boone, and states that Whitney's No. 20, Wealthy, Wealthy Seedling and Telfer Sweet, called hybrids, are excellent fruit, but show no trace of crab in leaf, bud or fruit.

THE PRESERVATION OF OUR FORESTS

would seem to be a question worthy of consideration, in view of cyclones, storms and floods which have to some extent prevailed

in certain sections of our land, and which have doubtless been occasioned, more or less, by the depletion in our timber and forestry supplies. The area of our wooded lands is steadily decreasing year by year, and as a consequence important changes have been wrought both in our soil and climate. This feature is not characteristic simply of this State, for we in fact are much less subject here to heavy storms than certain sections further south and east, and yet the ill effects of constant thinning out our forest trees are readily observable by all.

While visiting the eastern portion of New York, last fall, this matter was most forcibly impressed upon our mind. Marked indications were everywhere presented of the disastrous evils consequent on this pernicious practice of deforestation. The lumbermen have largely cleared the timber in the wooded districts of that state, and consequently springs and streams are drying up. The water of the Hudson, at Albany, has been effected and made so low as seriously to interfere with navigation. The number and extent of floods, as well as frightful storms, is yearly on the increase.

In view of facts so readily to be observed why should there not be prompt as well as proper action taken upon the part of state and national legislators to remedy to some extent, if possible, this crying evil, and bring about some wholesome change? It might be well for us more carefully to note the time and bring to bear our influence so far as possible, in order to secure the better and more general observance of Arbor day. The young especially should be encouraged to plant out trees of various kinds.

THE AMERICAN HORTICULTURAL SOCIETY.

At the request of the president and members of executive committee of our Society, we attended the meeting of the American Horticultural Society, at Cleveland, Ohio, being present the last two days of the session, which began Sept. 7, 1886, and continued four days.

This society was organized eight years ago, under the name of the Mississippi Valley Horticultural Society. At the session held during the exposition at New Orleans the name was changed to the more comprehensive one of the American Society.

The meeting was held first at rooms of the board of trade, afterwards at the tabernacle on Ontario street. The capacious

hall was elaborately decorated with evergreens, plants, ferns and flowers. The ample tables, arranged in the form of a hollow square, were well laden with a remarkably fine exhibit of fruits, including numerous varieties of grapes, over forty varieties of pears, many varieties of apples and peaches, thirty varieties of plums of every color, etc. Mr. Cushman of Euclid, exhibited fifty varieties of grapes, and Mr. Hubbard of Fredonia, N. Y., a new seedling showing twenty-five large bunches of white grapes on three feet of wood. Seventy-five varieties of apples were exhibited by a local society, and one fine exhibit from Mississippi included twenty-nine varieties of apples, besides several varieties of pears.

There was not a large attendance of delegates owing to the fact that railway managers refused to make any reduction in rates of fare and members of the society being detained at fairs and other gatherings held at about the same time. About half the states were represented, however, quite a number of the leading horticulturists of the country being present; the larger portion of those in attendance represented local horticultural societies, and citizens of Cleveland. Ontario, Canada, had a representative, and one delegate from Japan was present. For want of space we can give only a brief outline of the proceedings, as gleaned from notes taken and from newspaper reports of the meetings.

President Parker Earle presided at all the meetings with his usual ability and grace. Secretary Ragan presented the financial status of the Society, which showed a balance of \$173.12 on the right side. He then read a paper on "The past, present and future of grape culture in California," by Geo. Husmann, of that state. He thinks California is pre-eminently the horticultural state of the Union, as fruits of the temperate zone flourish side by side with those of the tropics. From an experience of five years there he gives a brief outline of grape culture in that state since 1874, when the Mission Grape was the only variety known there. Now he says they have nearly four hundred sorts, and expect to produce 20,000,000 gallons of wine this year, equal in quality to any on the globe. "Our raisins are competing with the finest London 'layers;' our table grapes go to every city in the Union. We have the best climate under the sun to produce a perfect product; have learned all about location, soil, varieties; can handle the product better, have fewer diseases, and we can furnish the world with better and cheaper wines, raisins, table

grapes and brandies than any other country, while our area for successful production is larger than that of France. Good grape land is worth \$50 to \$100 per acre, and can be brought to bear for \$100 per acre more. Then five tons of grapes per acre, at \$20 per ton, at \$20 per acre for cultivation annually.

A discussion of the paper and varieties in general followed. Mr. Green, New York, saw how cheap Chinese labor enabled California growers to compete with producers of the East, notwithstanding high freights. Mr. Miller, Penn., thought Worden superior to Concord, from one year's trial. He asked Mr. Hubbard concerning a tendency to drop from the stem. Mr. Hubbard said all reports were to the contrary. He had visited the original vine on Mr. Worden's place, which had produced one hundred and ten pounds of grapes annually for three years past. The present crop was the finest he ever saw. Worden is larger, handsomer than Concord, a week to ten days earlier; quality of a first-class Concord; no rot. Mr. Hollister, Mo., reported a very short grape crop in that state, fruit rotting badly. He condemned the practice of selling unripe grapes to get high prices early. Dr. McKay, Miss., said it was a poor grape year there. Concord did best, and was generally regarded as the safest to plant between the 30° and 35° of latitude. Scuppernong never failed, but was not good for market. Excessive rains for thirty days had caused much rot. Mr. Miller had found sulphate of iron a preventive of rot. Mr. Lindsay, N. C., spoke of the increase of grape culture in his state. The eastern section is the home of the Scuppernong, one vine often covering three acres. Seventy-five varieties bunch grapes grown in the middle section, where the finest grapes in the country are raised. Ives and Champion pay best. We call Worden the best black grape. Mr. Van Deman, Kan., reports a good grape crop. He had visited many vineyards in Texas and Arkansas, and found fair crops in spite of the drought. He alluded to the noble work of Mr. Munson, of Texas, who is sowing seeds of wildings, and crossing seedlings with the best cultivated sorts. Some wild bunches there are one foot long, and the grapes are fine.

Mr. G. W. Campbell, Ohio, said: "In Central Ohio, this is the best grape season since 1849. Early and late sorts are ripening near together. I was one of the first to raise Worden in Ohio. It is larger than Concord, juicier, ripens earlier, but it has all the faults of that kind—a tender skin, a poor shipper." Mr. Carpenter, Ohio, thought high culture gave better grapes

and prevented rot. Mr. Te Mari, of Japan, who since the World's Exposition has been studying American horticulture at Lansing, Mich., and other points, then made a few remarks. His people are beginning to grow American grapes. "We had no wine until our country was opened; the Chinese had raised wine grapes for many years. Now we shall have wine, too. There are only two varieties of native grapes in my country. We live so much on vegetable food, eating grapes at table was never thought of."

PRESIDENT EARLE'S ADDRESS.

At the evening session Mayor Gardner delivered an address of welcome which was responded to in a graceful manner on behalf of the society by President Earle, who then proceeded to deliver his annual address. This was an excellent, comprehensive and practical paper, covering the whole field of horticulture. He said the society was organized to meet the wants of the fruit growers, gardeners, forest growers and lovers of rural art in the states of the Mississippi Valley. We have been asked to extend our territorial limits and to embrace all of the horticultural interests of the continent, from ocean to ocean. After much deliberation this was done at our meeting in New Orleans, so that we are now in name as we had been for years before in membership and in the spirit of our work, an American society.

There was scarcely a state in the Union whose industrial development, whose entire civilization did not show the deep imprint of organized horticultural activity. It is seen in bending orchards, in burdened vineyards, and in fruitful gardens. It hangs banners in every part of town or city, and sings pæans in groves and forests planted by man or saved from the woodman's axe. It babbles in fountains built and in brooks preserved, and its beauty shines on 10,000 green and shaded lawns, and in every window where flowers bloom and vines clamber. If you could take out the influence of horticulture from the structure of our civilization, you would have left a system of bare walls, hard farms, and coarse living, in whose presence we should be strangers as in an unknown world.

Horticulture in its larger definition covered a large field. There is an æsthetic and an economic side to it, and he could not tell which had developed most in late years. Horticulture co-operates with education, religion, and moral culture. All

honor to those who have made our country the most fruitful and flowerful under the sun. Thirty years ago the strawberries of the Chicago market could have been carried in a wagon; now they require immense railway trains; three hundred to six hundred tons of the fruit come in daily, and over a quarter of a million persons are engaged in the harvest. He contrasted the poor little flower bed half hidden in the farmer's yard, and the spikes of hollyhock at the front door in years gone by, with the embowered mansion and cottages of the present day. Alluding to complaints of over-production of fruit, he regarded the evil as resulting rather from imperfect distribution. We are marketing too poorly, and there is no obstacle in the way which may not be overcome. We should know more of fruit culture in Russia and Asia. He spoke with earnestness on the forestry question. Without forests no successful agriculture was possible, and no high civilization could be maintained. Every year of timber waste made the matter worse. Seasons change; destructive floods are followed by consuming droughts. The forces of nature are unbalanced. In 1853 the State of Ohio had fifty-four per cent of its surface covered with forest; in 1884 only seventeen per cent remained. Do you wonder at the inundations, the harder winters, hotter and drier summers; or at the absence of the sparkling brooks that ran and sang all summer? He quailed before the inexorable penalties nature had in store for all states and peoples who would ruthlessly destroy so glorious a heritage of forest as the American people once possessed. Our woodlands should be reserved by absolute force where the government has the right, and by all encouraging legislation where it has no control.

President Earle's address was quite lengthy, the above being only a brief abstract. It was loudly applauded, and 2,000 copies were ordered printed in pamphlet form.

On the morning of the second day a paper was read by J. M. Smith, of Green Bay, Wis., on protection of crops in time of drought. He recommended thorough drainage. He used tile on his grounds, and in dry weather gave extra cultivation. Wood ashes was a good fertilizer. He had three acres of strawberries on ground well manured for several years, which produced 1,000 bushels of berries and sold for over \$2,200. It paid to irrigate, and for this purpose he had water works erected, at an expense of \$1,000.

Mr. Ohmer, Ohio, gave his experience with blackberries in

dry weather, stating he had realized \$1,000 from a four-acre patch. Mr. Harrison, of Painesville, had put in about seventy acres of tile last spring, at a cost of forty-five dollars per acre. Prof. McKay, of Mississippi, thought drainage very essential, especially in wet weather. Their tile-drained land had done as well during dry weather as in the wet season.

Mr. Te Mari, of Japan, read an interesting paper on "Vegetables in Japan," from which we extract the following: "When I say a single root of burdock is sometimes worth twenty-five cents in Japan, you will be surprised at the high price for such a noxious weed, and imagine we have no vegetables; and when we hear you pay that price for a quart of blackberries in this country, we may think you may not have delicious fruits here. But we have many culinary vegetables of good quality there, and you have here an abundance of fruits. We have no vegetable so extensively used as radishes. The roots are not small, nor round, nor red in color, but mostly cylindrical, or club-shaped, from one-fourth of an inch to over a foot in diameter, from six inches to over a yard in length, and are grown the year round. Our carrots are smaller but longer than those of this country, and of high color. Burdock comes third in general estimation, and grows a foot in circumference, three feet in length; is soft and delicious. We have turnips, white and red, used as radishes are in this country. Taroes (*Colocassia*) are grown and used as potatoes. *Allocassia*, an ornamental foliage plant in America, belongs to the same family, and possibly may be the same species. Our annual product is estimated at over 6,000,000 bushels. Taro (*Leucocassia gigantea*) is grown for the stock, used as salad. Konjak is grown on moist, shady ground, and is made into gelatinous cakes for use. Onions are grown like celery in this country, and have long, tender stalks. Varieties of peas and beans are numerous. The most important among our pulse is the soy bean, the annual product being about the same as that of wheat, viz.: 11,500,000 bushels. Animal foods are almost entirely excluded from our tables."

Mr. Te Mari is a young man who appeared to be greatly interested in the proceedings of the meeting, but he speaks English with considerable difficulty.

Several papers were read in the afternoon, among the number one by Mr. Grenier, of New Jersey, on "Transplanting;" one by Mr. Lovett, of same state, on "Nut Culture;" one by Mr. Hale, of Connecticut, on "Small Fruits." These papers elicited

considerable discussion of an interesting nature, which was continued at the evening session.

On Thursday, the third day, officers were elected, considerable business transacted, awards of premiums made, etc. Following is the list of officers for ensuing term of two years: President, Parker Earle, Cobden, Ill.; first vice president, E. M. Hudson, New Orleans, La.; secretary, W. H. Ragan, Greencastle, Ind.; treasurer, J. C. Evans, Harlem, Mo.; with one vice president from the other states of the Union, for Minnesota J. S. Harris, La Crescent, being named. The committee on nominations recommended the holding of the next meeting in California in February, 1888.

Mr. Van Deman, of Kansas, read an interesting paper on "Pomology as a Division of the Department of Agriculture." He stated that an act had been passed by Congress establishing a division of pomology and appropriating the sum of \$3,000 for the purpose of carrying on the work, in addition to salary. He urged the importance of experimental stations, the gathering of statistics, investigations as to the value of new fruits, and the issue of reports and bulletins from time to time containing information of special interest.

Mr. H. Myrick, of Massachusetts, read a vigorous paper on "The Press and Horticulture." The press had done much to encourage fruit growing, but had done little towards telling how to sell fruit. Fruit growers want the press to aid them in selling and to discover new markets. Fruit reports should be better looked after. Horticulturists should write for the press.

Prof. Lazenby, of the Ohio State University, gave an address upon comparative growth of trees, illustrating his remarks with specimens of wood from the experimental station. For fence posts the locust was superior to the catalpa; for profit the ash is one of the most promising and thrifty of trees. Timber culture would pay as an industry, and should be urged for profit rather than economic reasons.

Your Secretary was then called upon to read a paper, prepared by Mr. J. S. Harris of Minnesota, on "Fruit Growing in the Northwest." The paper gave an outline of the history of fruit growing in this section of the country, referring to the failures experienced in the past, the success achieved thus far and the prospects for the future. It elicited considerable discussion, and we hope to present the paper elsewhere in full in this volume.

Mr. Campbell, of Ohio, spoke on grape culture, on which subject he is thoroughly informed, recommending the best culture and care. An animated discussion followed, the grape question being one of vital interest among Ohio fruit growers. Interest was manifested to know what varieties were most profitable in Minnesota and among our favorite varieties we mentioned the Concord and Moore's Early.

At the evening session, Prof. McKay gave an interesting account of the success of the agricultural college of Mississippi, which was now crowded with students, four hundred being registered, with a capacity in the institution for three hundred and fifty. He maintained that it required as much education to become a successful farmer as a member of the learned professions. The college was co-educational, ladies being admitted. He stated they had excellent lands in their state for fruit raising, a statement fully sustained by the fine exhibit of fruit from that state.

A paper was read from Dr. Hape, of Georgia, on "Horticulture in the Mountain Region," giving an outline of the status of fruit growing in that state and the measure of success achieved.

The meetings were interesting throughout and the deliberations characterized by harmony and the best of feeling. The awards made were numerous and liberal and in the main satisfactory.

VISITING THE VINEYARDS.

On Friday, the fourth day, the members of the society accepted an invitation from the Eastern Cuyahoga Horticultural Society, to visit the vineyards in and about the village of Euclid. At 8 o'clock some seventy-five of the visitors went to Lake View Cemetery, going out via the celebrated Euclid Avenue, visiting the tomb and monument of Garfield and spending an hour at the cemetery grounds. We then boarded the 10 o'clock train on the Nickel Plate and rode some ten miles to the crossing where teams and carriages were in waiting to convey the party through the vineyards and suburban farms. The various localities and farms visited appeared to be planted almost entirely to grapes which at this season were in their height of perfection, the vines being fairly loaded down with tempting clusters of Concords, Catawbas, Delawares, Niagaras, Isabellas, etc., etc. From the summit of a high hill or ridge, a fine view of the neighboring vineyards was obtained. To the north lay a level plain spreading out towards Lake Erie, which was but a few miles

distant. There are nearly five thousand acres in vineyards in this vicinity; the industry has proven very remunerative and lands in this vicinity are held at high figures. The methods of cultivation appeared to be quite uniform, a very simple trellis being used, and the vines grown in rows, near together.

The guests were royally entertained at the residence of E. H. Cushman, the president of the local society. On his beautiful lawn, among the trees near the farm house, tables were spread where an elegant repast was served. The Euclid Cornet Band enlivened the scene with music.

Dinner over, President Earle was introduced and a number of toasts were given and responses made by leading delegates present. Resolutions were adopted complimenting the local society upon the management of the fruit exhibition, thanking the press and board of trade for courtesies shown, the Forest City House for reduced rates of fare, and returning thanks to the good people of Euclid for their hospitable treatment.

Taking the 5 o'clock train we returned to the city. The weather had been remarkably pleasant, and the trip was one greatly enjoyed by all and the day one long to be remembered. Thus closed the seventh annual meeting of the American Horticultural Society. It is scarcely necessary to add that the meetings attended were greatly enjoyed by your Secretary, and that the kindly greetings and courtesies shown us by officers and members of the society will long be remembered.

THE SOCIETY.

With regard to the work of our Society it may be said that there has been substantial progress made in the past year. There is good reason for encouragement at the marked and steady increase in the number of our active, paying members, which indicates awakened interest and willingness to help advance the work of the Society. Our annual reports have been in greater demand than heretofore and there has been considerable inquiry for them from parties living at a distance in other states. The facts brought out in our discussions, the varied information thus elicited, is often quite important, especially from those more actively engaged in making tests and practical experiments in various departments of horticultural work.

A live society should be aggressive in its work; it will endeavor to surmount the serious obstacles or hindrances which may be

now and then encountered. Some method will be found to overcome the gravest difficulties, and often a comparison of views may aid the inexperienced member in seeking out the best and wisest plan to be pursued.

The local horticultural societies within our State are mainly doing prosperous work. Some new societies have been established in the year and there is room for many more. In this regard the work begun should be continued, and members of our own Society may often render valuable assistance to help along this worthy cause. Our objects being so reciprocal there should be mutual interest manifested upon the part of all.

EXPERIMENT STATIONS.

We note with pleasure what is being done for the advancement of horticultural work, to which attention was directed in our last report. The agricultural and horticultural stations in the land are rapidly increasing, and the importance of these useful agencies for gathering accurate information concerning means and methods to be used are certainly becoming better and more generally known and recognized. Our sister states are specially active in this work, and horticulturists there are moving in the right direction.

Our State, embracing as it does a large expanse of territory, some two hundred and fifty miles in width by three hundred and fifty miles in length, covering many degrees of longitude and latitude, and larger in area than all the New England states, must of necessity present some marked characteristics in variety of soil, climate, exposure, etc., etc.

The work accomplished in experimental lines within our State, though not as far advanced as could be wished, is making rapid progress, and certainly the outlook for the future is encouraging. For more specific data as to what has been accomplished we would refer to the reports that have been handed in and elsewhere will appear in proper place.

It scarcely need be stated here that the assistance rendered by the State for the encouragement of horticultural work has proved of much advantage and that the money thus expended has yielded fair returns. Results thus far secured would seem to indicate that such investments are surely wise and proper to be made. No doubt the need of work upon this line is still as great as heretofore and in the future there will be as large a field for

usefulness as in the past, for our Society and all its active members.

VOLUME FOURTEEN.

The last volume of our transactions was issued in July, and for the variety and extent of the information therein contained was most creditable to the Society. Our thanks are due to officers, members and others, for the assistance kindly rendered in the work of preparation and for contributions made. Much credit, too, is due the publishers, the Messrs. J. W. Cunningham & Co., for the satisfactory manner in which the work of printing and binding was performed. The work of publication was delayed by other state reports, as "copy" was delivered in the month of February. This volume has a few less pages than the preceding number, but in point of fact has considerable more reading matter than any other of the series. In order to bring the book within reasonable limits it was found necessary to print the larger portion of the articles contributed in brevier. It might be well to bear in mind that since our space is limited there should be studied brevity in all discussions, as well as in the papers read.

There were in all 1,000 copies bound in cloth, at an expense to the Society of one hundred dollars; the larger portion of which number was required to furnish our own members and make exchanges with societies in neighboring states, as has been customary heretofore.

Among the many notices received, we quote the following:

REPORT OF THE MINNESOTA HORTICULTURAL SOCIETY FOR 1886. — Embracing the proceedings of the Society from March, 1885, until March, 1886. The volume is edited by Secretary S. D. Hillman, of Minneapolis, and is published by the state. The meetings of the Society were characterized by the high standard of the papers furnished, and the discussions which followed are very fully reported. The secretary has a special department of his own, occupying fifty pages at the close of the volume. In this, he has placed short accounts of the transactions of other societies, notably of the American Pomological Society, together with interesting correspondence which adds materially to the value of the volume. — *American Horticulturist*.

The annual report of the Minnesota State Horticultural Society for the year 1886, embracing the transactions of the Society from March, 31, 1885, to same date, 1886, together with the pro-

ceedings of its annual and semi-annual meetings, and the essays and reports read at them has been received from the secretary, Mr. S. D. Hillman, Minneapolis, Minn. The Minnesota Horticultural Society is already well and favorably known to their co-workers throughout the country, and this report, embracing as it does many practical papers on important subjects with the discussions had thereon will most certainly add to that appreciation. As with the report of our own state society we shall hope from time to time to draw from those pages for the instruction of our readers as the returning seasons call for them. — *Colman's Rural World*.

The annual report of the Minnesota State Horticultural Society for 1886 has been received. As usual it contains nearly five hundred pages, but the matter contained and its arrangement make it one of the best reports that has yet reached this office from any of the states. The horticulturists of Minnesota can well feel proud of their recent achievements and the excellent records made for the North Star State in fruit growing. — *Minneapolis Farm Stock and Home*.

FROM HON. MARSHALL P. WILDER.

DORCHESTER, July 11, 1886.

Thanks for the interesting and useful report of the Minnesota Horticultural Society, which has done so much, and is always doing, good work: Hoping that the Society will come down in full representation with her good and grand friends to the meeting of the American Pomological Society next year at Boston, I am as ever, the friend of your Society,

MARSHALL P. WILDER.

S. D. Hillman, Secretary, etc.:

Five weeks ago to-day the hand that penned those kindly words was stilled in death. The life of that great man went suddenly but sweetly out, like morning incense to the skies.

Secretary Manning, of the Massachusetts Society, writes:

"His last illness was quite short. He was at the meeting of this society on the fourth of December and afterwards presided at the monthly dinner of the Massachusetts Agricultural Club, of which he was president, on the same day. He was generally very constant in visiting these rooms every Saturday and generally came in once or twice a week besides. * * * Thursday morning

he ate his breakfast as usual, went into the library, attended to some business with his son, signed a letter and when the doctor came in conversed with him, told him that the severe rheumatic pains were all gone, and as he put his hand up to his breast where they had been, expired instantly. This was about half past nine in the morning. Dr. Johnson described such a death more than a hundred years ago:

“Then with no fiery throbbing pain,
No cold gradations of decay,
Death broke at once the vital chain,
And freed his soul the nearest way.”

It was a fitting tribute which was paid by our Society on Tuesday night to one whose name has been so long revered and loved by all. The record of his noble life will be an enduring monument to his memory as future days and years go by.

The finances of the Society are in most satisfactory condition, as shown by Treasurer Grimes' report.

The following is a statement of receipts and disbursements by the Secretary for the year ending Jan. 18, 1887, as shown by itemized statement submitted:

SECRETARY'S FINANCIAL STATEMENT.

RECEIPTS.

Membership fees for 1886.....	\$48 50
Membership fees for 1887.....	25 25
Total.....	\$73 75

DISBURSEMENTS.

Envelopes.....	\$2 25
Picture frame.....	3 00
Expenses at Cleveland meeting as delegate.....	5 00
Expressage and drayage.....	18 10
Postage stamps and cards.....	33 25
Amount due Society.....	12 15
Total.....	\$73 75

Respectfully submitted,
S. D. HILLMAN,
Secretary.

The annual report of the Treasurer was then read.

TREASURER'S ANNUAL REPORT.

To the President and Secretary of the Minnesota State Horticultural Society :

THE MINNESOTA STATE HORTICULTURAL SOCIETY, IN ACCOUNT
WITH J. T. GRIMES, TREASURER, FOR THE CURRENT YEAR
ENDING JAN. 20, 1887.

RECEIPTS.

1886.		
Jan. 21.	From the secretary, membership fees.....	\$57 00
Feb. 8.	State treasurer, one-half annual appropriation..	500 00
8.	By error in last year's account refunded.....	7 23
Sept. 24.	Balance state appropriation for 1886.....	500 00
Dec. 9.	Balance state appropriation for 1885.....	100 00
1887.		
Jan. 11.	Sam Partridge, membership fee.....	1 00
20.	From the secretary, membership fees.....	73 75
20.	Membership fees at winter meeting.....	25 00
Total receipts.....		\$1,263 98

The following accounts have been paid as shown by vouchers herewith returned:

DISBURSEMENTS.

1886.		
Jan. 20.	Borrowed from contingent fund, current expenses.....	\$195 99
21.	A. W. Sias, vice president, incidental expenses.....	4 80
21.	M. Cutler, incidental expenses.....	3 85
21.	G. W. Fuller, incidental expenses.....	3 10
22.	S. D. Hillman, account audited.....	35 55
22.	N. R. Tilton, janitor's services and plates, winter meeting	2 75
22.	Premiums on fruits, vegetables, fine arts, etc.....	68 00
Feb. 24.	A. B. Seymour, expenses attending annual meeting.....	23 10
Mar. 12.	T. M. Smith, delegate to Wisconsin Horticultural Society..	18 15
12.	J. S. Harris, delegate to Wisconsin Horticultural Society...	8 50
June 17.	Executive committee, meeting with the State Agricultural Society.....	10 80
17.	S. D. Hillman, salary first quarter.....	100 00
17.	Premiums paid at summer meeting.....	60 50
July 1.	S. D. Hillman, salary second quarter.....	100 00
21.	J. W. Cunningham & Co., binding 400 copies reports.....	100 00
21.	S. D. Hillman, account audited.....	70 10
Aug. 24.	J. W. Cunningham & Co., drayage on books.....	4 00

Oct. 1.	A. W. Sias, expenses on seedling commission.....	\$25 00
1.	G. W. Fuller, expenses on seedling commission.....	28 23
1.	J. S. Harris, expenses on seedling commission.....	51 65
1.	S. D. Hillman, salary third quarter.....	100 00
Nov. 29.	N. H. Winchell, Buckton's Aphidæ, for library.....	30 00
Dec. 24.	Brown, Treacy & Co., printing programs, etc.....	10 75

AUDITED AND ALLOWED AT WINTER MEETING.

1887.

Jan. 20.	Brown, Treacy & Co., membership tickets.....	\$2 75
20.	J. S. Harris, expenses seedling commission.....	33 70
20.	M. Pearce, delegate to Dakota	3 50
20.	Ditus Day, vice president, expenses 1886	6 50
20.	J. T. Grimes, incidental and traveling expenses, 1886.....	7 50
20.	M. Cutler, vice president, expenses 1886.....	2 60
20.	S. D. Hillman, account audited	61 60
20.	E. H. S. Dartt, vice president, incidental expenses.....	4 00
20.	Wyman Elliot, president's salary	25 00
20.	S. D. Hillman, salary fourth quarter.....	100 00
20.	J. T. Grimes, treasurer's salary	25 00
20.	E. A. Cuzner, librarian's salary.....	10 00
Total		\$1,336 91
Total receipts.....		\$1,263 98
Borrowed from contingent fund.....		72 93
		<hr/> \$1,336 91
Balance contingent on hand.....		\$809 47

GENTLEMEN: With your acceptance of this report I close my books as the treasurer of this Society. My age admonishes me that I should lay aside the active duties of life. You have long honored me with many important trusts. How well those trusts have been performed it is not for me to say. If I have done my duty, it was only my duty, that which you had a right to expect. There are younger men and more active horticulturists among you. I say, give the boys a chance.

With many thanks for your kind regards, I still hope to meet with you for many years to come.

Respectfully submitted,

J. T. GRIMES,

Treasurer.

The reports of the secretary and treasurer were, on motion, accepted, and referred to the finance committee.

REPORT OF FINANCE COMMITTEE.

JAN. 20, 1887.

Having examined the within reports and compared the same with accompanying vouchers, we hereby approve the same as correct; we recognize in Mr. Grimes an efficient and faithful officer in whose trust we hope to continue the finances of our Society.

J. M. UNDERWOOD,
J. S. HARRIS.
DITUS DAY,
M. PEAROE,
Executive Committee.

LIBRARIAN'S REPORT.

Among the books received the past year through the hands of the secretary, are the following:

25 copies	Wisconsin Horticultural Report	1886
50 "	Dakota " "	1886
10 "	Illinois " "	1885
12 "	Michigan " "	1885
12 "	Kansas " "	1885
30 "	Montreal " "	1885
12 "	Missouri " "	1885
15 "	Iowa " "	1885
6 "	Indiana " "	1885
15 "	Ohio " "	1886
12 "	Colorado " "	1884-6
12 "	Massachusetts " "	1885-6
3 "	Pennsylvania " "	1885
5 "	New Jersey " "	1885
6 "	Western New York Horticultural Report	1885

A portion of these reports have been distributed among officers and members of the Society. Several hundred copies of our reports have been sent out during the year, including several complete sets.

E. A. CUZNER,
Librarian.

Mr. L. L. May. Mr. President, if I am in order and you will allow me; yesterday, I understand, there was quite a discussion arose on the mode of doing business, conducted by L. L. May & Co., of St. Paul?

President Elliot. Yes, sir.

Mr. May. I am here to-day to open up the discussion — not knowing anything of the meeting; only in justice to myself I feel that this association should allow us the privilege of counteracting some of the charges which have been indicated by Mr. Gideon and others. If any special time could be appointed that would be convenient for the meeting I should be glad to have the time set.

President Elliot. This is Mr. May, I take it?

Mr. May. Yes.

President Elliot. We are happy to meet you; it is a question that interests us all and I hope we can give the time for it. If there is no objection we will set it for the opening discussion at 2 o'clock.

Mr. May. Thank you, that will suit me.

The following paper was then read:

THE NEW STRAWBERRIES.

By Geo. J. Kellogg, Janesville, Wis.

Mr. President and Members of the State Horticultural Society:

By request of your secretary, I write a few thoughts and facts. Since the advent of the Wilson, nothing has had the deserved boom until the Crescent. There have been McAvoy's, Agriculturist, Boyden, Great American, which measured fourteen inches, Triumph de Gand, Jucunda and Sharpless, and one hundred and forty-nine others of local merit, and the other two hundred are coming. You may just as well count out your two dollars a dozen and go in with the tide. Many new kinds are already disseminated and partially tried; many of them are a success. Of the more recent kinds, I think May King the best mate for the Crescent yet sent out, and Parry for Jewel; but I will not cumber this paper by mentioning the kinds we have on trial. We must try all kinds, and "hold fast that which is good."

THE "JESSIE."

Your secretary asked me to say something about the "Jessie," one of Mr. F. W. Loudon's group of over fifty varieties of

seedlings. This kind has fruited five years. In 1884 twenty-six berries, making two quarts, were shown at the Chicago convention. These were either overripe or badly handled, as they did not show good shipping qualities. The past season (perhaps owing to the drought) they were much firmer. If there is any weak point in the Jessie, this is it, lack of firmness for long shipments. I picked two quarts one evening for trial on the table, but when I got home selected one quart and sent it with other fruit six hundred miles, and forty-eight hours after picking it was in good condition. But this is no test of shipping qualities.

The wonderful show of Jessie at our June convention, and the visit to the two acres in bearing, captivated the whole crowd, and we did "*Resolve*, That the show of 'Jessie' exceeds anything we have ever seen, in size, productiveness and quality; and we believe it possesses more valuable qualities than any variety now disseminated." This is very strongly put, but the facts fully justify the resolution. The trials on a variety of soils here, and Mr. Crawford's report from Ohio, lead us to believe that it is a prize worth the seeking. It is large, too, very large, uniform in shape and color, perfect in the blossom, very healthy and vigorous, wonderfully productive, and stands drought splendidly. In competition with Sharpless, it took first prize for size; and competing with Atlantic, Prince of Berries, Mrs. Garfield and many others, it took first for quality. This is but one of the fifty kinds now fruiting, and Mr. Loudon is raising new seedlings from the best crosses every year, by the hundred. He has doubtless thrown away many kinds far ahead of many that have had a wonderful run. He has some that surpass in size the Jessie, and may prove better on further trial.

DISCUSSION ON THE "JESSIE."

Mr. Cutler. As this report has brought the Jessie strawberry before the Society I should like to hear something further about it; I think before investing very heavily in this new berry we had better get the full facts in the case; and then I would advise not to invest too heavily. As Mr. Smith was mentioned as one of the gentlemen who visited the grounds where it grew I should be glad to hear from him.

Mr. J. M. Smith. Mr. President, I was one of the number of the members of our state society when they made the trip last

summer to see the Jessie. On its native ground it certainly did make a creditable showing. At that time the ground was very dry and there were cracks in the ground large enough to put your hand down among the plants. The berries were large; they would average as large as Sharpless and of better form. One was brought to me measuring nine inches or perhaps eight and seven-eighths inches. That was quite a perfectly formed berry and I think I could have picked bushels, if necessary, without taking any that measured less than four inches in circumference, and from that to six. The quality I thought very fair, but not as good as one or two other varieties he is testing.

The question in regard to that fruit resolves itself simply to this: Will it do as well away from home as it does on its native grounds? New strawberries are usually sent out with flaming posters, but it is a fact that a variety often does well in its native home when under other conditions it may prove to be entirely worthless; it may fail entirely when taken away from its home. Boyden No. 30 is an instance; it made a remarkable growth and was the wonder of the place at home and the fruit sold for enormous prices; and yet, on land only twenty miles away, it was not worth ground room; it was an utter failure. I don't say this will be the case with the Jessie.

Mr. Crawford, of Ohio, and myself were perhaps the only ones who had any of the plants previous to last year, and he told me they were doing very well indeed and promised well. Mr. Chas. A. Green, of New York, has the distribution of the plants and has lately come out with a circular setting forth their merits and using my name rather freely. I wish to say that if the plant does as well all over the country as those I saw last summer were doing, that it will prove a very great accession to our strawberry list.

I don't want to injure the berry, but I wish to say here that I have not been satisfied with the way it has acted on my grounds; there may be a reason for it that I don't know of, and I shall try it further. In firmness the berries are not equal to Wilson, but will bear shipping with Crescent and are much better in quality.

Present Elliot. Will you state what kind of soil Mr. Loudon has?

Mr. J. M. Smith. I think most of it is oak openings. They made a magnificent showing on his ground and I have nothing to take back from what our society said of them.

Mr. Stubbs. Can you give the parentage of the variety?

Mr. J. M. Smith. I think the Sharpless for one and I have forgotten the other.

Mr. Stubbs. Is it a staminate or a pistilate?

Mr. J. M. Smith. It is staminate or perfect flowering. A perfect flowering plant is really hermaphrodite, from a Greek word signifying both male and female, or a perfect flowering plant.

Mr. Bunnell. Have you tried it on sandy soil?

Mr. J. M. Smith. I tried it on different ground; I couldn't find any place where it did well.

Mr. Bunnell. I planted some on sandy soil and it didn't amount to anything whatever.

Mr. C. L. Smith. I tried them on sand, clay, gravel and on black loam, and they didn't do well on any of them.

Mr. J. M. Smith. I wrote Mr. Green in regard to their action on my soil; he replied there was something "peculiarly unfortunate" about my soil, that nothing seemed to do well except the Wilson.

Mr. Kramer. The Wilson don't do anything on my grounds; I have tried them several times and they are worthless on my grounds.

The following paper was then read:

BIRDS IN HORTICULTURE.

By E. E. Harris, La Crescent.

Every animated creature has its mission to perform and that the mission of the birds is a very important one, no intelligent person will deny. There are various ways in which birds are a blessing and benefit to the human race, but as all will agree their chief mission as related to mankind is to destroy and keep within proper bounds the millions of injurious insects which infest our land. Nothing has been created in vain, but if the only mission of the birds is to eat worthless insects and the insects are only bird food, then the creation of both birds and insects was unnecessary. Anyone who has ever examined the great plan of creation with an unprejudiced eye must have noticed how wonderfully each creature is adapted to its own station, and has its own work to perform which could not be done by any other creature. And as man is placed at the head of all creation, it is but reasonable to believe that all creatures, no matter how in-

significant they may seem to the casual observer, are in some way directly or indirectly beneficial to the human race.

Undoubtedly the great object in the creation of birds was to beautify and enliven the earth and make it a pleasant and agreeable habitation for man.

In order to successfully accomplish this object a very great variety of birds was necessary, and so complete is the collection that they are bountifully distributed all over the earth, inhabiting the different elements, land, water and air, in profusion, and each species fitted by nature to live in its own country, so that from the frozen regions of the north to the burning desert, wherever the foot of the discoverer has trod, birds of some kind have been found. And in order to supply these birds with proper food a very great number of insects are necessary. We will suppose then, for convenience, that the majority of insects which are injurious to vegetation are for bird food though no doubt they have other duties to perform which the limited vision of man can not discern, and while we censure them for their bad qualities, let us not lose sight of the fact that they are gratuitously performing important tasks which we could not hire done, and so they are all right in their proper place, but from a horticultural point of view the best place for most of them is inside of the birds. There are a few insects which are directly beneficial to the fruit grower, principally those that feed on other insects. Now let us notice this important fact that birds do not eat carnivorous insects. The same is true of all animals. The lion does not eat the flesh of the tiger, nor does the tiger seem to relish leopard meat. Notice also that man never eats the flesh of carnivorous animals or birds, preferring instead the flesh of animals that feed on vegetables, and birds whose diet is at least partially vegetable. Now it is the same with birds whose instinct teaches them to distinguish between the tender and juicy cut worm and the bitter stink bug, which eats potato beetles. So we must admit that all birds which eat insects are beneficial to the horticulturist and those only injurious which feed principally upon vegetation or that prey upon smaller birds of insectivorous habits. There are many other ways in which birds are a benefit to man. The flesh and the eggs of the game birds are a great addition to the food product of all nations.

Their feathers serve as personal adornments, toothpicks and pillows, and before the introduction of metallic pens, they were the implements with which our worthy ancestors wrote some

very queer and good thoughts. We are told that in China and India a variety of water birds called cormorants are taught to catch fish and carry them to their masters. In our own country they have been used as messengers.

But time will not permit us to notice all the good done by our feathered friends. In the eyes of the average horticulturist, they are simply insect destroyers, and as such they do not receive the notice and protection which they really deserve. Now, supposing that insects are principally bird food; in order to satisfy the enormous appetites of the birds, it was necessary in creating insects to have the reproductive faculty predominate. And some varieties are astonishingly prolific, laying thousands of eggs during a life of but a few days; and Nature's great incubator works better than any patent self-regulator which the ingenuity of the Yankee ever hatched up. It has been estimated that one insect may in one year become the progenitor of 6,000,000,000 descendants. Three hundred and twenty-five thousand species of insects are known, and thousands more are as yet unknown to naturalists. If undisturbed, they would soon increase to such prodigious numbers as to destroy all vegetation and animal life would soon perish. Now the only thing which prevents this catastrophe is birds, and I say they are our best friends and well deserve our protection. The damage done to our crops by insects can not be accurately estimated, but that it amounts to several hundred millions of dollars annually in the United States alone is a certain fact. In our land of plenty this great loss is unfelt and unknown by the majority of the people, but the time is not far distant when some steps must be taken to prevent the ravages of insect pests, which are rapidly increasing as the birds are diminishing. But the question arises, What can be done? A man can not spend his time hunting worms, and he is not very well adapted to that kind of warfare. The very best way to fight them is with birds, and if let alone there would be enough of them to keep insects within proper bounds. Nature makes no mistakes, and the proportion of birds and insects is self-regulating and would always remain so if it were not for the interference of man. But that the birds are rapidly diminishing and the insects correspondingly increasing is a fact that sticks out so plain that "he who runs may read."

Now let us briefly notice the various causes of this alarming decrease of our birds. The larger birds of prey, such as the hawks and owls, no doubt destroy a great many beneficial

birds, but not so many as some imagine, for the little fellows are too sharp to be easily captured. Wild cats, foxes, skunks and other carnivorous animals come in for their share when they can get it, but mice, rats and other small mammals are so much easier captured that they do not molest the birds much. Domestic cats also kill great numbers of them. In our cold country the severe winters freeze and starve out many beneficial birds. The destruction of the forests drives a great many away, for they will not stay where there is no natural protection. These are some of the causes of the diminution of our feathered companions. But the great cause, and the only one that needs looking after, is man, who should be their best friend, for without birds successful fruit culture is impossible. Boys are allowed to go about robbing nests, with no other motive than morbid cruelty and degenerate cussedness. No doubt it would be a benefit to rob the nests of some birds, but notice that those are the very ones that are untouched, as such birds generally build in some inaccessible place. It is the innocent and beneficial birds that suffer most from the depredations of these juvenile hunters. Oologists also destroy great number of eggs. This evil is not so great, however, as the above mentioned one, as the indefatigable curiosity hunter takes the bad as well as the good, and no doubt in a majority of cases where nests are robbed the birds rebuild in some other locality. This, however, is no reasonable excuse for promiscuous plundering.

Great numbers of birds, both good and bad, are killed by taxidermists for stuffing. This is admissible only when the motive is the advancement of the cause of science. But when the specimens are used only as home adornments it is wrong, and should be prohibited by law. But a greater evil than any of these is the killing of game birds for food and sport, as some call it, but just where the sport comes in I have never been able to discover. The man who can look with pleasure on the death agonies of an innocent creature, knowing that his own hand has snapped the brittle thread of life, must be hard-hearted indeed. As far as sport is concerned, it is as good a test of marksmanship to shoot at a hunting dog as at an innocent bird, and the flesh of the retriever would be about as fit for food as a mutilated bird. We would not relish beef that had been torn in pieces by a cannon loaded with grapeshot; our poultry must be killed in the most approved way, and all animal food must be

properly dressed in order to be palatable. Why is it then that a bird filled with shot, mangled and unbled, is considered such a dainty. Now I am not blaming anyone for this state of things, the trouble is in the education and customs of the people.

But the greatest cause of the loss of bird life is the senseless fashion of wearing bird skins on hats and bonnets. In the United States many millions of birds are slaughtered annually, to supply the demand, and we are told that in Europe this fashion is even more prevalent than with us. Now this enormous slaughter of innocent and beneficial birds can not be long continued without disastrous result. Something must be done, and that quickly, or our fields, orchards and groves will soon be destitute of birds and overrun with noxious insects and crops will be a thing of the past. No doubt, if brought to the test the ingenuity of man would devise some other way of keeping the insects in check, but nothing better or cheaper than birds could be thought of. But how to stop this great waste is a difficult problem. No doubt the people can be taught to look at the matter in its proper light and abolish this cruel fashion, but teaching some people is a very slow process. Our present game laws are very inefficient as they merely prevent the killing of game birds during the breeding season and allow them to be indiscriminately slaughtered, even to total annihilation, at other seasons of the year, and our laws do not include many of our most useful birds, being specially designed to protect certain birds until a class of men erroneously termed sportsmen are ready to destroy them.

What we want is a law making the killing of any and all birds at any time a criminal offense, punishable by heavy fines and imprisonment. I will pile it on still thicker: a shotgun is a useless and dangerous implement and no man should be allowed to make, buy, sell or use one for any purpose whatever, except to ventilate dog skins.

But some will say if none were killed birds would become so plentiful that insect food would not hold out, and then our crops would suffer. There is no danger of that whatever. They have natural enemies enough to prevent any alarming increase; and who would not rather have his crops destroyed by these beautiful songsters than by repulsive vermin. But when they get so plenty that we can't raise crops for a living, it won't be hard to resurrect that monstrous fashion, and then we could all be bird-skinners.

Perhaps some expect on this occasion a classified list of our common birds, with a division of good and bad. It was my intention at first to attempt this, but I have about come to the conclusion that none of us are competent to make the division between beneficial and injurious birds. No doubt a great majority of them do some damage, and some do much more good than others. Among those that deserve particular mention as the most beneficial to the fruit grower and farmer are the robin, bluebird, catbird, brown thrush, nut-cracker, meadow lark, cowbird, pigeon, quail, flycatcher, woodpeckers, warblers, vireos, swallows, swift, nighthawk, whip-poor-will, orioles, tanagers, cuckoo, and I would like to include the bluejay, if there is no objection. These, we may be sure, do much more good than harm, and while I do not advocate the destruction of any, I would particularly recommend the above mentioned species as deserving our protection, knowing that we will be well rewarded for our trouble, and that time spent in the study of their habits will not be wasted. How to protect our birds has become a serious question, and the fruit growers should be the first to take active steps in their favor, for it is they who receive the direct benefit of their active labors in the destruction of noxious insects.

DISCUSSION.

Mr. Underwood. I can not discuss the paper read as I heard only a few of the closing sentences. But speaking of birds reminds me of the experience we had this last summer, and I would like someone to tell us what to do. It is an experience that perhaps is easily answered and perhaps covered by the paper, but I would like to hear what to do before I go home because I might forget it if I didn't find out now. If you had a nice crop of grapes and the birds had managed take the best part of them, I want to know what you would do about it; would you let them, have the grapes or shoot the birds?

Mr. E. E. Harris. I suppose I am expected to answer that question. We have had very much the same experience, as the birds are probably as thick in our locality as anywhere else. I don't say anything about that, because I object in all cases to killing the birds. I have lost a good deal of money on that account. By burning a good deal of powder and making a good deal of noise one can frighten the birds, but I would recommend one to be very careful about shooting not to hit any of the birds.

Mr. J. S. Harris. I might say that he is very careful of the birds while his older brother takes his gun and goes for them in earnest.

Mr. E. E. Harris. Well, he is only three or four years older than myself and as soon as I catch up with him I am going to lick him. [Laughter.]

Mr. Kramer said the birds last summer destroyed a third of his crop, ate one-third and left a third, so it was raising a crop on shares; one could put up a scare-crow to frighten them, but the robin was the meanest bird of all; it sits on a post and watches you put it out and as soon as he finds out what it means he goes right at the fruit same as ever.

Mr. E. E. Harris. Our friend Kramer has done fairly well; says he received one-third for his share; that is all I give my father. If the bird gets half his share I never shoot it.

Mr. Kramer. You want the birds to take one share, is that it?

Mr. Cutler. My neighbor, Mr. Crandall, prevents the birds getting his grapes by putting small paper sacks over them; he has practiced that three or four years.

Mr. Underwood. Last year we had some very nice grapes, fine and sweet, and were expecting to have two or three tons of grapes. In going through the vineyard one day I was surprised to find the birds had hardly left a bunch untouched. They must have taken nine-tenths of them. They did not eat them entirely but picked into the bunches and spoiled them. We had a pretty good gun and we made a slaughter among them by means of which we saved a portion of the crop.

President Elliot. Was it not pretty dry down there?

Mr. Underwood. Well, I should say it was; it was dry all summer.

President Elliot. I would suggest the propriety of setting out dishes with water in them near your vineyards where the birds can get a drink. It may be their thirst for water they wish to overcome more than anything else.

Mr. Underwood. I might be a little ungenerous, but the lake is close by us and the birds can go there for water. [Laughter.]

Mr. Harris. This is a serious question but there is no doubt in my mind that the birds are more beneficial than injurious. They are fond of small fruits and live largely on wild fruits. They take shelter among the vines at times and their sharp claws injure the grapes, the fruit splits open and the wasps and bees prey upon the fruit. Some birds are man's greatest friends.

There is one bird that is very destructive to evergreens, known as the yellow-breasted woodpecker. It is fond of boring holes in the trees.

Mr. Pearce. Is not that the wood sucker?

Mr. Harris. It is. Another is the cherry bird, which is very fond of raspberries and cherries.

Mr. Sias. I am decidedly opposed to shooting the birds. I like the suggestion of placing basins of water all around the vineyard. I would suggest in addition to that the propriety of putting a loaf of good white bread at each basin. [Laughter.]

Mr. Pearce. I have noticed the depredations of the birds are worse after the wild fruits are gone; after that they come in and take our grapes. I think this is a local question.

Mr. Stubbs. I have had some experience in raising grapes. The robins do me a great deal of damage, and the last few years I have adopted the plan of using paper bags. I find the expense is not so great after all, as I actually get enough more from the crop to pay for the extra work, and it proves a complete protection.

Mr. J. M. Smith. I am afraid our president's cold water won't work very well. My grapes grow right by the side of the water, and the birds certainly like grapes better than they do the water. My protection is to put the sacks on, which can be done very cheaply, and the bunches will be a little larger.

Prof. Porter. By covering one protects the grapes from disease as well as birds. There is increased growth, and the dust and dirt is guarded against.

Mr. Pearce. Wouldn't there be danger of water getting in?

Mr. Stubbs. If lapped around and pinned on at the corner there is no trouble from water. I use a common two-pound grocery sack.

Mr. Gilpatrick. I think it will pay a man five dollars a day to use the sacks, and besides it beats the birds.

Mrs. Stager. I have tried using coarse cloth with success.

Mr. C. L. Smith. The advantage of using paper sack is their being so much cheaper, and less work to put them on.

Mr. Stubbs. I buy the sacks for a dollar and twenty cents per thousand.

Mr. Grimes offered the following resolution, which was, on motion, adopted:

Resolved, That the secretary of this Society be instructed to have 5,000 copies of the address of President Northrop, delivered before the Society last evening, printed for general distribution.

The following paper was presented by Mr. Smith:

NOTES BY THE WAYSIDE.

By C. L. Smith, Minneapolis.

Mr. President and Gentlemen of the Minnesota State Horticultural Society:

Since our last meeting I have traveled over a large part of the State while engaged in institute work, under direction of Prof. Porter, and generally speaking on horticulture. I have made the acquaintance of those interested in fruit and tree growing at the points visited.

The most northern point visited by me was Moorhead, Clay County, on the Red River. Here I found the Red Dutch, Victoria and White Grape currant doing well, the bushes being loaded with fruit; there seems to be no obstacle to successful currant growing in the Red River Valley that is not found elsewhere. Cultivated Weaver, De Soto and wild plums were also doing well; strawberries were exceptionally fine. The soil of the valley seems to be specially fine for this fruit. As the ground is very flat it is found advisable to ridge it so as to give surface drainage. Raspberries have not been very successful, owing to lack of winter protection; where covered they have done well. I found one man at Moorhead who was trying blackberries; by covering his vines with dirt they had wintered well, and on June 1st were covered with blossoms. Another had been successful with grapes. Am inclined to the belief that with proper care some of the earlier varieties will yet be successfully grown there.

At Glyndon one man has done something with small fruit, but his first venture in grapes and currants was bankrupted by grass and weeds; of Wilson strawberries he had raised a fair amount of fruit which had finally surrendered to the universal foe, "grass." He planted currants on clean, rich ground and by keeping them free from grass by mulching with clean straw or cornstalks, their strong, healthy stems, rich green leaves and rapid growth gave promise of success. A plat of Turner raspberries that were perfectly hardy had killed so badly as to produce but little fruit. A few bushes that were protected from the exhaustive effects of blizzards, freezing, thawing and drying, were bearing well. He had faith that he could grow raspberries profitably. His second planting of strawberries, in rows

four feet apart, on ground that had been well manured, back-furrowed in ridges sixteen feet wide, and well harrowed to give surface drainage, were doing finely.

About Detroit, in Becker County, small fruits and the Transcendent crab seemed to be doing well. This is a timbered county and from an examination of the soil and the fruits growing there I am satisfied it is well adapted to the production of all kinds of small fruits; however, there is very little grown there at present; the county has been deluged with hybrids, said to be better and hardier than the Transcendent, which appear to be either dead or dying. I visited one farm where fifty such trees had been planted; only three were alive; four Transcendents in the same field, four years from planting, were clean, sound, healthy trees and loaded with fruit. Where Red Dutch currants had been planted they were doing well, but as near as I could learn most of those who had purchased currants had invested in Fay's Prolific at a dollar apiece and the returns had been so small they were disgusted with the business.

In Otter Tail County the situation was much the same, although I found more here who had been successful owing to the fact that many of them had bought better trees and plants. Transcendent, Duchess, Beecher's Sweet, Hyslop, Whitney and Wealthy are in many instances bearing well.

Geo. F. Cowing, of Fergus Falls, had some very fine grape vines that were loaded with fruit; the varieties were Delaware and Concord. He had three trees of Weaver plum that were loaded the heaviest with plums of any trees I ever saw. The trees were sound and healthy, having made a vigorous growth each year since planted. M. T. Duncan and John Bock have both been quite successful with small fruits.

The soil through a large part of this county is quite loose and freezes very dry in winter. Heavy mulching for currants and raspberries seems to be the best guard against the effects of winter drought. Turner raspberries without winter protection would live but would not bear enough to pay. I visited one farm where they had an abundance of currants and raspberries in bearing for several years, the only cultivation given being a liberal mulch of straw each fall. We had raspberry shortcake for dinner, and on discussing the cost learned that they regarded it as almost nothing; only half a mile from there, the next day we had a prune pie; not quite so nice, but much more expensive, as the prunes were imported, costing ten cents a pound,

and were paid for with wheat at fifty-two cents a bushel. This man could not afford one dollar for membership in our Society, but had just given an order to a traveling tree peddler for two dozen strawberry plants (pistillate variety), with a beautiful name only two dollars; a "tree rose," three kinds grafted on one stalk, two dollars; five budded apple trees, imported direct from Russia; only \$2.50; three Fay currants (the tree variety), \$2.50; one celebrated Russian Mulberry, one dollar; etc. Is it any wonder the poor victim of misplaced confidence thinks our soil and climate unfitted for successful fruit culture?

In contrast to this we cite the experience of Wm. Danforth, of Red Wing. His model farm is located on the Cannon Valley Railroad, two and a half miles northwest of Red Wing. Mr. Danforth is by profession a civil engineer, and his time is divided between his profession and the care of his farm. A few years ago he turned his attention to small fruits and bees. As a preparation for the business he secured the best books and papers he could find and carefully read up what had been learned by others. He procured a swarm of bees and familiarized himself with their habits; he also planted a few raspberries, strawberries, currants, grapes, etc., and with book or paper in hand began to study plants and vines. As a result he has today an apiary that is first-class in every respect, winters his bees without loss, controls the swarming, regulates the production of honey, and this season secured over one hundred pounds of choice honey per swarm. His strawberry crop this year was a surprise to himself and all his neighbors. There was very little rain during the season and the drought was severe on all crops in his locality, yet his strawberry crop came out abundant in quantity and excellent in quality. The varieties grown were Wilson, Crescent, Downing, Glendale, Manchester, Old Ironclad, and some others, but Wilson and Crescent were the best. His ground is clay loam, had been previously manured and was in fairly good condition. He set his plants in April, in rows four feet apart, Wilsons sixteen inches, and Crescents twenty-four inches in the rows; the cultivation was shallow but frequent; throughout the season the runners were thrown along the rows, forming matted rows of plants about two feet wide; all weeds or grass growing among the plants was pulled out by hand. In November he mulched the whole surface with straw, with the exception of a few rows where he used straw between the rows and cornstalks over the plants; they all came out bright and

nice in the spring, but those covered with the cornstalks seemed rather the brightest, and he thinks he would prefer the cornstalks over the plants, using the straw between the rows. As soon as vegetation started in the spring the mulch was drawn between the rows and left to retain the moisture and keep the berries from the dirt. The Wilsons were the first to ripen; they did not yield quite up to the Crescent, but were found more valuable for market and for canning purposes. Some customers would buy only Wilsons, and he will plant an acre of them next spring. The Crescent were alternated with Wilson, Downing, Glendale and Ironclad, the rows of Crescent yielding much more than any other sort; they were bright, highly colored and well adapted to home market and immediate use. The average price received at wholesale was two dollars and twenty-five cents for twenty-four box crate; the price paid for picking, two cents per box.

As soon as the fruit was gathered the plantation was plowed, with the exception of one block; the mulch was stirred up on this and burned over, burning out the old plants, the space between the rows cultivated thoroughly. There were enough young plants left so that now the rows were quite full and give promise of an abundant crop next year. Mr. Danforth is well pleased with results and is satisfied that he had the right method of cultivation. He has a fine lot of raspberries, including Philadelphia, Turner, Cuthbert and the blackcaps; he gives them winter protection, covering with either dirt or straw. He regards the Cuthbert as the best.

Mr. Danforth is a member of the State Horticultural Society and attributes much of his success to the lessons learned in their meetings and from their valuable reports. He is setting an example that should be imitated by thousands of our Northwestern farmers.

At Morris, in Stevens County, J. P. Lowater had some very fine Duchess trees, eight years old, healthy and vigorous, loaded with very large, fine-colored, perfect fruit. He had one tree of Beecher's Sweet that was so loaded with fruit that the lower limbs were bent to the ground with the weight of fruit; the tree was about twelve feet high and was a perfect pyramid of fruit, which was exceptionally large and fine flavored. His Transcendents, Hyslops and Orange were all bearing well, no signs of blight or blackheart; currants, raspberries and strawberries doing well.

One of the finest groves of Scotch pine and European larch I have seen in the State was to be seen in the village of Morris.

At Browns Valley J. O. Barrett has made a fine start in the way of small fruit and timber seedlings and I hope we shall have a report from him.

Our honored friend, G. W. Fuller, of Litchfield, certainly has the most complete collection of trees, in the best condition of any that I found west of Minneapolis.

At Foster, on the east side of Big Stone Lake, Irving Mathews has a fine collection of small fruit, also Transcendents are doing well. I suppose Col. Stevens would not forgive me if I neglected to say that he also has several Catalpas that have proven hardy and are growing nicely.

I believe the seedling fruit committee have visited a large part of the State, but I would like to mention S. O. Taggart, of Cottonwood County, who from an investment of \$14 in root grafts and Scotch pine seedlings, 1,000 of each, 8 years ago, has to-day 970 Scotch pines, 10 to 30 feet high, and a bearing orchard of 400 trees, mostly Duchess and Wealthy. His trees were planted on deep, rich, black soil, with clay subsoil, slightly sloping to the south; ground kept free from weeds by shallow cultivation, early in the season. Trees did not injure two years ago. He had sold young trees to his neighbors for more than enough to pay all the expense incurred.

While at Pipestone I spent two days and nights with Job Whitehead who took a tree claim near the Indian pipestone quarry eight years ago; he has ten acres of fine timber, willow, ash, box elder, maple and cottonwood. He has raspberries, currants, blackberries and strawberries. Mr. Hoag, of Rochester, had given him one of our reports for 1885 and I found he had been an apt scholar; his raspberries and blackberries were covered with dirt and straw, his strawberries were grown in matted rows, properly mulched, and he was so full of enthusiasm about fruit growing that he wants to plant ten acres of berries this year.

Mr. Harris, Mr. Pearce and myself spent two very pleasant and profitable days with the Dakota Horticultural Society at Sioux Falls, but Mr. Harris has already reported this meeting very fully.

Princeton, Mille Lacs County, is a point which I think has not been heard from yet. They have a soil and location very favorable to successful fruit growing, but little has been done as yet.

Wild strawberries, blueberries and raspberries are abundant; currants, raspberries and strawberries have been grown by a few and have yielded well. Crab apples, Duchess and Wealthy, under favorable conditions as to stock and care, have done quite as well here as in other parts of the State. Protected from blizzards by an abundance of heavy timber, quick soil, not affected by droughts, I predict that this region will soon be competing with the local garden for the small fruit trade of St. Paul and Minneapolis.

In conclusion I would say that I found no point but what will produce small fruit in abundance when good plants are grown, properly planted and cared for. The obstacles are:

1. New and untried sorts, at high prices, which the farmer is induced to buy, not because they are the best for him to plant, but because the dealer can make most profit out of them.

2. Careless packing and handling.

3. Poor preparation of soil and careless planting.

4. Weeds, grass and stock.

5. Neglect to give winter protection.

6. Drought.

7. And least of all, cold.

Avoid the first by buying old and well-known sorts that may be bought for a nominal price; second, patronize reliable dealers; follow the rules found in each report of the Horticultural Society and the cold will be powerless to harm; to bring all this about publish 20,000 primers of horticulture and scatter broadcast over the State.

The meeting then adjourned till 2 o'clock P. M.

AFTERNOON SESSION.

THURSDAY, Jan. 20, 1887.

The meeting was called to order at 2 o'clock P. M. by President Elliot, who stated that an opportunity would now be afforded Mr. May to be heard; it might be well to state how the matter came up.

The secretary then stated that the question had been asked through the "Question Box" if anyone knew where the nursery firm of L. L. May & Co. was located, which had elicited some discussion.

President Elliot read an extract from a letter from Mr. Gaylord, of Nora Springs, stating that: "A firm of L. L. May & Co. claims to be northwest of St. Paul two or three miles. Is this firm genuine? The agent is here selling the Gideon apple at one dollar each, representing they are growing these trees there and that they have the entire stock." To bring this matter right to the point, he would like to inquire if there was such a firm as L. L. May & Co. in St. Paul, or a representative?

Mr. May. Yes, sir, there is and I am that representative.

President Elliot. Where is that located?

Mr. May. Our offices are located in the First National Bank building, corner of Fourth and Jackson.

President Elliot. Where is your nursery located?

Mr. May. Our nurseries are located in Rochester, New York.

President Elliot. What stock are you selling?

Mr. May. We are selling the Gideon apple more particularly; a general line of nursery stock.

President Elliot. Will you furnish a list of this stock to our committee on fruit lists?

Mr. May. I will.

President Elliot. Are you selling the same class of stock in Southern Minnesota that you are for Northern Minnesota and Wisconsin?

Mr. May. No, sir; not by any means.

President Elliot. We would also like a list of the prices at which you sell nursery stock.

Mr. May. We can give you those. I wish to make a few remarks about the Gideon apple. It was originated here, at Lake Minnetonka, by Peter M. Gideon. Some years ago Mr. Gideon sold that variety, with the distinct understanding that the parties buying this variety were to have the sole right of propagation of it. It was sold to Messrs. Chase Bros., of Rochester, N. Y.; they paid Mr. Gideon the sum of two hundred dollars for that variety. Some fifteen months ago Chase Bros. wrote to us that they had a fine stock of this variety, and wished us to take it and sell it. Knowing the variety to be hardy, we of course put it on our list willingly, and we have been selling it to this day, and intend to sell it; and we defy anyone to come forward and show that we can not deliver the genuine variety. We have been in this business some eight years, and located in St. Paul. We commenced in a small way as dealers, and our business has grown until it has extended through all the West-

ern States, and as far west as the Pacific coast. We employ one hundred and fifty men to sell for us. We are selling such stock as Duchess, Wealthy, Gideon, Fameuse, and other varieties. We have aimed constantly for these eight years to place before the public in the states of Iowa, Minnesota, and Illinois a variety of nursery stock which will give every satisfaction. In my mind, and in the minds of many from whom we have valuable testimonials, we have aimed to give people a variety of stock that would do well, and that they would succeed with. Of course, as with all nurserymen, more or less trees die; but we have been the instrumentality—if I do say it myself—of furthering horticulture in this city and in the Northwest as much as anyone in the Northwest, and handling as much stock as any two nurseries combined. What I say here are words of truth. I can show recommendations as to quality of stock which we deliver, and as to the satisfaction with the stock which we sell. These insinuations have been cast out from time to time by Mr. Gideon. He dare not come out boldly and say that we can not deliver the Gideon apple. We defy him to do it. We can deliver it and do deliver it, notwithstanding his coming out and trying to convey the idea that we are frauds. Will these gentlemen come out and state what they mean, so that we can have recourse through the courts if we can not get at them through this association? We have done the best we could to place before the people of the state of Minnesota stock that will do well. You can take it here in the city of St. Paul; eight years ago when we came here there was very little shrubbery to be seen; now look at our city with its lawns and beautiful yards and grounds. Of course we have been gradually getting into this; and what we sell, gentlemen, we deliver true to name, and we deliver the best stock that can be grown. I will state right here to Mr. Gideon—

President Elliot. Mr. Gideon is not present.

Mr. May. I beg your pardon; I will state here to you, Mr. President, don't you think a Duchess apple raised in the state of New York, or a Gideon apple, a Wealthy, a Transcendent crab—any of those varieties—that it is just as hardy as if it was raised here?

President Elliot. Our Society has discarded them.

Mr. May. I see the Iowa society recommend the Duchess and Fameuse.

President Elliot. Yes.

Mr. May. Then why do you discard those varieties?

President Elliot. We do not, but we discard the methods by which they are produced; if you go to Rochester you see how they are produced. They manure their land, their object being to get large, thrifty trees and cause a growth the first year of two or three feet, the second year from three to four feet; and that is done at the expense of the hardiness of the tree. We all know that such stock will not grow in Minnesota and you can't point your finger to a tree that has been produced under that system of cultivation that has proved to be hardy.

Mr. May. I beg to differ with you. I can show you those varieties that are growing in Minnesota, Iowa and Illinois. There is a good deal said about acclimatization; but you can take a Duchess and plant it at the South and bring it here and it will be hardy! The same with a crab.

President Elliot. Crabs, we will admit, may be.

Mr. May. One is just the same as the other.

Mr. C. L. Smith. Do you inform your agents that your nursery is at Rochester, New York?

Mr. May. Yes, sir, we do.

Mr. Smith. Do your agents inform your customers that your nursery is at Rochester?

Mr. May. That I cannot say.

Mr. Smith. I can say that they do not.

Mr. May. I have heard it said that we represented that we sold nothing but Minnesota stock; but I say when they do that they are stating a falsehood, nurserymen must import more or less.

Mr. Smith. Well, I denounce that as absolutely false.

Mr. May. Well, sir, I can prove it to you notwithstanding.

Mr. Harris. When these agents introduce this stock do they sell it for four times the value of the stock?

Mr. May. It depends on the quality of the stock; you can't compare a one-year-old tree to a four-year-old.

Mr. Cutler. I would like to ask you if you haven't authorized your agents to say that you grew this stock here in St. Paul that they have been selling, and in your own nursery?

Mr. May. No, sir; I have not and you can not produce the proof of it.

Mr. Cutler. Had you a man working for you by the name of Jordan, last year?

Mr. May. No, sir; no such man in our employ. I may say

there are unscrupulous firms who have agents going through the country selling inferior stock. You can take our blanks and you will see that we specify everything is of a certain age and of a certain grade; the contracts are such if this stock is not in condition, up to size and quality, no purchaser need to accept it. As to selling stock true to name; we claim to be a responsible firm; of course you can easily find out through any of the banks and the mercantile agencies; we agree to deliver stock true to name and if it is not purchasers have their recourse. And as to selling all classes of stock in the same section, I will state a few points on that. For Northern Minnesota we run almost entirely on small fruits and crab apples; for Iowa we sell under a larger line; Illinois and Southern Wisconsin the same; but our principal trade consists mainly in such stock as roses, shrubs and small fruits. And I might say here, as I understand this Society is bonused, as you might say, by this government; it receives a thousand dollars a year for the promotion of horticulture. Now, as a resident of this city, as a taxpayer, I consider that I contribute to the support of that, while still your Society comes up and denounces me as a "fraud." I say it is a piece of infamy — *a piece of infamy*, and legislation will have to be had on it sooner or later; my interests are at stake here and I intend to see that I am placed in a proper light before the community.

Mr. C. L. Smith. That is what our Society intends also.

Mr. J. M. Smith. A young man came to me in our place, a straightforward and truthful young man, and stated to me that there was a firm at St. Paul by the name of May & Co. that wanted him to sell nursery stock, representing to him that the stock was grown in or close to St. Paul. Did he tell the truth, or did he lie?

Mr. May. He did lie, most assuredly. I defy any member of this Society to show me wherever I have instructed one of my men to represent that we are selling stock grown in St. Paul. Our trade comprises much stock that is grown in other states; we could not grow all this stock; people know different. This talk is all bosh, gotten up by rival firms to injure us.

Mr. C. L. Smith. I met one of your canvassers about a year ago and he said your nurseries were about a mile north of St. Paul. I called at the office of L. L. May & Co., in this same National Bank building, and their clerk informed me that their stock was out about three miles, but he did not have time to go out there with me.

Mr. May. I will wager you a hundred dollars that no clerk in my office ever made that statement to you. I will put the money up and donate it to the orphan asylum. I tell you talk is cheap.

President Elliot. We want to get at the bottom of this thing. and we have some few here that have run against the agents of this L. L. May & Co.

Mr. J. M. Smith. The gentleman I referred to I have known a good many years. I said to him, "You had better write over there. I know some of the Minnesota people and I have never heard of any such firm, although it may exist." A few days afterwards he came to me again saying that he had further letters from May & Co., and they wrote him their stock was grown in or about St. Paul, and that it was perfectly good. How is it that this young man should turn liar all at once?

Mr. May. Well, I don't know; but I assure you upon the word of honor that I have never represented to my men that our stock has been grown in Minnesota.

Mr. J. M. Smith. Did you send the man good stock—that was reliable—when you filled his orders?

Mr. May. I think we do. We pride ourselves on the quality of stock we ship; I don't say all of it; I will leave that to you; what do you think of our stock?

Mr. Smith. The most of it I thought was very poor.

Mr. May. What varieties?

Mr. Smith. I didn't buy but little of it myself. My wife bought a little vine.

Mr. May. What kind of vine, please?

Mr. Smith. I forget the name of it.

Mr. May. Of course you are horticulturist enough to know that all varieties don't grow alike.

Mr. Smith. Where large quantities of stock were sold, as far as my experience goes, it did not live well.

Mr. May. Of course there is a good deal in the care of stock. But what I may say here is this, we don't claim to grow our stock in Minnesota. What we claim is we grow our stock in Rochester, New York. We deliver stock true to name of the hardiest varieties and of the best varieties that come out. We are now propagating some seedlings through our agents, and in a year or so shall have those for sale.

Mr. Cutler. Where are you propagating them?

Mr. May. In Rochester, N. Y.

Mr. C. L. Smith. What is the location of your nursery at Rochester, N. Y.?

Mr. May. It is about eight miles east of the city, at Penfield.

Mr. Smith. You have your nurseries there?

Mr. May. We have our nurseries; we are growing on shares with several parties. We get our principal stock of roses from Elwanger & Barry; we buy them. The nursery business is not conducted as it was years ago. Years ago nurserymen used to grow their own stock, now it largely passes out of their hands. Elwanger & Barry hardly keep a man on the road now, but the dealers do this work; it is virtually a separate branch of business.

Mr. Brand. Are you acquainted with the varieties you handle?

Mr. May. We are.

Mr. Brand. So you can pick them out at sight?

Mr. May. No, I can't do that. It requires a man to be constantly working among trees. I see them perhaps three times a year; I don't do the propagating myself.

Mr. Brand. Are you selling in this locality Winesap, Ben Davis, or Haas?

Mr. May. No sir, we are not. We have them in our list but we do not recommend them for this section of the country.

Mr. Sias. Do you recommend the Mann apple?

Mr. May. No, we don't recommend it but we handle it.

Mr. Brand. Do your agents handle these tender varieties?

Mr. May. Of course you know the trouble of handling 150 men. Agents will talk more than they should in a good many cases, in order to sell; of course you know that. Alexander is a good apple and we are selling it.

Mr. Smith. Why do you have your nursery in Rochester instead of in Minnesota?

Mr. May. It is thoroughly demonstrated in the growth of young trees in a nursery they need good soil and good cultivation to make them thrifty.

Mr. Harris. It is certainly too severe treatment to take young stock grown in an Eastern or Southern nursery and bring it here and replant the trees in this climate, without putting on overcoats.

Mr. May. Well, I claim it is all right.

President Elliot. Experience has not proved that yet.

Mr. Brand. Do you sell the Walbridge?

Mr. May. Yes, we sell the Walbridge.

President Elliot. Have you had any agents at St. Cloud or in Sauk Rapids in the last two years?

Mr. May. I think we have.

President Elliot. I would like a statement from a lady here who has had some experience with certain things sold in that vicinity.

Mrs. Stager. I would like to ask Mr. May about his strawberry tree that he sends out, which grows three feet high and you can pick strawberries from the top of it; several of our ladies in the village bought them and have been waiting for them to bear. They bought two years ago, from an agent of L. L. May. I can't say whether they would bear as the cyclone took the plants away, but would like to know if there is such a thing?

Mr. May. I doubt very much—I have never sold a strawberry tree with a representation of fruit being on that tree.

Mrs. Stager. Well, that is what the agent said.

Mr. May. The strawberry tree is a shrub, the burning bush—a flowering shrub.

Mr. Harris. It is known, I suppose, as the Wahoo?

Mr. May. I don't know that I have ever heard the name before; it is a shrub. So far as representing a strawberry tree to grow strawberries, that I never have.

Mrs. Stager. I was asked to inquire about this, and there was one thing that the agents of May & Co. told was that they had their nursery here at St. Paul and the fruit was perfectly hardy. Several neighbors bought of them. Last year they came through selling the Sharpless strawberry at, I think, \$2.50 a dozen. The agent sold all through the village and wanted to sell me fifty and said he wanted me to have them anyway. I said I would not take them if they came. In the spring L. L. May sent me a card and said they were shipped to me; I wrote back I had never signed for them and would not pay for them. But the plants came and all who had signed for them had to pay. He sent his bills to a lawyer there, who told me he would sue me and I would have to take them. He said he had my signature to the order; and I told him if it was I would pay him, but he had to allow it was not, and therefore I didn't pay for them.

Mr. May. You did perfectly right.

Mrs. Stager. I hardly think there is a tree or shrub standing now that we bought of you two years ago. One man was told your nursery was here at St. Paul and he ordered, it seems to

me, nearly a hundred dollars worth of trees. Our neighbor, Mr. Fogg, had engaged to take about eight hundred dollars worth of stock and would have done so but another neighbor sent down to see if there was any such nursery, and as he could not find any such concern Mr. Fogg refused to take the stock he had ordered.

Mr. May. I remember the case of Mr. Fogg. It was a large bill of some six hundred dollars. We wrote to that gentleman the whole facts of the case, and as this man was not very responsible we wanted him to advance half of the money before we shipped the stock; that he refused to do and it was not sent to him; it was totally on account of Mr. Fogg's inability to pay for the stock.

Mrs. Stager. Mr. Fogg had concluded to mortgage his place to get the money and he called on my husband to ask us about it; and he would have done so had not he received word by this neighbor when he wrote to St. Paul to find out about it.

Prof. Maginnis. Can you show by your letter book, Mr. May, in regard to those transactions?

Mr. May. Yes, sir; I can.

Mr. Bunnell. I wish to say that I have been on the road considerable and I often come in contact with men selling Mr. May's stock. Some two years ago I received a letter from my father wanting to know if there was such a firm. I know the agents have represented the stock as being grown at Rochester, N. Y.; there was nothing wrong in that.

Mr. May. This is unsolicited from a representative of the Lake City Nursery in this State. I have no more to say. My business transactions have been free and above board and I defy anybody to show to the contrary; that is all I have to say. Of course if you have a mind to placard me through the minutes of your meeting, or the publication of your book, you are at liberty to do so; but I have come here with a frank, free, open confession, and stated to you the full facts of my business. I leave it with you as gentlemen to act upon this in a proper way, and not to resort to the low means of casting insinuations through the papers; those are things I despise. Let us get right at the facts and then we know what we are doing; but these insinuations we have no time for.

Mr. Regester. Had you an agent a year or two ago by the name of Fairfield?

Mr. May. Yes, sir; I had.

Mr. Regester. I don't know anything about you or your firm but I know that Fairfield is a swindle; I know that.

Mr. May. It is pretty hard for me to be responsible for all the men in my employ.

Mr. Regester. I might tell a little circumstance. This Fairfield was in our neighborhood at the time.

Mr. May. What location?

Mr. Regester. Granite Falls, Chippewa County.

Mr. May. Oh, yes.

Mr. Regester. He was through there and wished me to go in to the business and I thought perhaps I would; he met me on the sidewalk, and said he would give me a little lesson as I was thinking of going into business; so I listened to him, and it is the first lesson and the last one that I ever took on the business of swindling, but he gave it to me in such good shape that I thanked him and told him if that was the way—

Mr. May. You might tell it and enlighten some of these other gentlemen so they will have a chance!

Mr. Regester. He said to take up one or two articles, put them forward and praise them up to customers and keep their mind right there as he did with me; if they go to talk just talk them out, don't let them have anything to say, and occupy them until you get them magnetized. I was swindled to the tune of twenty dollars but he didn't swindle me any more; you see I was a "stranger" and he took me in. [Laughter.]

President Elliot. I think we have gone about far enough; we have spent half an hour. If Mr. May will furnish his list and the prices attached we may in correspondence the coming year be able to develop something in the operations of this L. L. May & Co.; for I propose as one of the executive officers of this Society to follow this thing; and if there is such a thing as hedging out these itinerant tree peddlers, these men from Eastern firms, coming in here and putting upon our State and upon our people stock that is grown in a southern climate, that is wholly and totally worthless, why we propose to do it. [Applause.]

Mr. Harris. We propose to make the firm that sells responsible for the work of their agents.

Mr. Latham. Mr. Chairman, I don't know how much has been said on this subject before I came in, and I don't know what the view of the Society is in regard to the amount of responsibility that a firm shall take as to the character of the agent that he sends upon the road. Messrs. May & Co., of St. Paul,

may be doing an entirely legitimate business. There is certainly nothing out of the way in a man selling Rochester, N. Y., stock. I wouldn't condemn a man entirely on that account. The trouble seems to lie not perhaps with Mr. May—I don't know the gentleman—but there is something wrong about his agents, and if he is responsible for them then he certainly will be in bad odor through the state of Minnesota. I have a letter in my possession from a gentleman who writes to me that there is an agent in his place working for May & Co., selling nursery stock there that he claims is coming from my nursery, and I know that isn't so.

Mr. May. There are a number of men going through selling under our name.

Mr. Latham. I think a man who sends an agent on the road in Minnesota anywhere should be responsible for what the agent says. Mr. May looks like a man of his word; he ought to see that his agents don't say anything that he can't back.

Mr. May. I would be pleased to show to the committee the contracts we have with our agents, binding them down in the manner we do. I will mail them to Mr. Elliot. Of course men on the road are anxious to make sales. They talk more than they should. Having such a large force it is utterly impossible for us to keep track of every sentence a man utters in taking an order. We take the precaution to print on our orders that any outside talk or bargain of the agent shall not affect the contract in any manner. We do that in order that people will not say "oh, well, he agreed to do this and agreed to do that," and to give people an idea that they must not expect anything only what is embodied in the order precisely.

President Elliot. Do you have those read over to your customers?

Mr. May. Mr. Elliot, I will ask you a question. Before you signed your name wouldn't you read that contract?

President Elliot. Is the contract on your bill, or order?

Mr. May. It is on the order, which is made in duplicate. Mr. Smith, I think if you remember—if you signed an order—you were left a duplicate of your order.

Mr. J. M. Smith. I bought nothing myself.

Mr. Bunnell. I saw Mr. May's contract.

Mr. Smith. I think it has occurred to you that you are exceedingly unfortunate in your agents.

Mr. May. That is of course a misfortune of any firm doing

business. We have on during the year, I suppose, four hundred or five hundred men. Some fail and some make a success of it. I don't care how conscientious a man may be, how close he may try to look after his business, it is utterly impossible for him to watch all the acts or remarks of his agents.

Mr. Cutler. I would like to inquire if Mr. May has not been informed that his agents have misrepresented as to the stock that he sells?

Mr. May. Yes, sir; we have. But what right have you to expect anything more than what the order calls for? That is the fault of the purchaser. The orders are plainly written and printed. They should know what they sign.

Mrs. Stager. I want to say that a good deal of this fruit is sold to men and women that don't understand the language, and any sort of writing they can not read at all. Up our way there are a good many foreigners and they have to depend on the agent in what they buy. Therefore, he ought to have agents he could depend on.

Mr. May. Well, as I say, it is difficult to get them.

Mr. Cutler. Mr. President, the acknowledgment he has just made is sufficient to condemn him in any part of this State. He has acknowledged that his agents have misrepresented.

Mr. May. Suppose I did; what of that?

Mr. Cutler. With this knowledge you have allowed these men to go on?

Mr. May. Excuse me, how do you know?

Mr. Cutler. Under the law you are responsible for the acts of your agents.

Mr. May. I am responsible for my contracts.

Mr. Cutler. He has acknowledged he is selling stock grown and raised in New York, such stock as was condemned by this Society years ago. His whole statement here, it seems to me, condemns the firm; that is the way it looks to me, and I think the Society, to do justice to itself, will put itself on record in opposition to the transactions of this firm, or any firm selling Eastern stock, representing it to be grown in this State. Two years ago there was some \$6,000 worth of stock sold in our county by the "chain nurseries." This work has been going on year after year. Five or six years ago agents from Dayton, Ohio, swindled the people of this State out of thousands of dollars. Are we to allow these things to go on and allow innocent persons to be imposed upon? I consider it equal, if

not worse, than highway robbery. These people not only impose upon the people by taking their money for worthless stock, for which there is no compensation, but there is a loss of time also. I have known people to spend ninety to one hundred dollars for stock, such as peach trees, pears, cherries, etc., which were utterly worthless. Our legislature should pass some law to prohibit this kind of fraud. That is my idea about this, and I hope this Society may accomplish something for the protection of innocent purchasers. This man Jordan that came around selling the gooseberry tree had a picture of a tree with him which represented a tree some six feet high, with a fifty cent piece in front with the berries larger than the half dollar. One of my neighbors gave an order for \$100 worth, and when the trees came to be delivered he compromised with the agent for \$50, so he didn't lose but \$50 that time. Usually they send around another man to deliver the stock so there is no chance for the man to object who has been duped by the fraudulent representations.

Mr. Grimes. I think this discussion has gone about far enough. We understand ourselves pretty thoroughly, and as the secretary is keeping a record in regard to the matter it will come out in our transactions. But there is one point that has not been touched upon in the controversy; that is the influence these agents and outside parties have in pawning worthless stock upon the citizens of Minnesota. Our legislature is expecting something to be accomplished through our Society for the promotion of the horticultural interests of the State, and if we take no action in this matter will they not conclude our Society is a failure? Our work is worse than thrown away if we are only misleading the people. I hope this convention will take some appropriate action in this matter to place us in a proper light before the representatives of the people; we are friends of the State and propose to protect the people of the State and their interests.

Mr. Sias. I see that Mr. May is about ready to leave, and he promised us a list of his fruits that he has been selling here; and I would say that I am chairman of the committee to revise the fruit list and when it is convenient would be glad to get the list, especially of the common apple.

President Elliot. We want a full list of the stock they are selling.

Mr. May. We will mail it to you, or deliver it to you.

Mr. C. L. Smith. I presume I have been asked a hundred

times whether there was such a nursery here at St. Paul, that was carried on by L. L. May & Co.; now, I did not know and consequently have evaded a direct answer. Would it be satisfactory to answer all such questions, No?

Mr. May. I certainly should.

Mr. Pearce. I have been quiet on this subject and would like to say a word. I am opposed to agents and think the sooner the agency system is abolished the better it will be. Have no prejudice for or against this firm; I attend to my own business and don't go outside of that; I don't care what this man or that man does. I have sold stock to May & Co., sold them good stock, which had been delivered and is doing well; I will say that for them.

Mr. Bunnell. I don't think there would be many orchards in Minnesota, if it was not for the middleman.

Mr. Pearce. I am speaking from thirty-three years' experience in Minnesota. The quicker we strip every agent from Minnesota the quicker we will get apples.

Mr. Bunnell. The grangers tried that I believe and they have played out.

Mr. Latham. I was glad to hear from our friend from Sumter; he hits hard when he can see anything to hit, but I hope he did not hit anything he ought not to hit. It seems to me the farmers are a little to blame; there is no excuse for their being swindled if they read the papers. Of course the farmer never looks at the contract he makes when he gives his order for stock. I have taken a good many contracts and I don't remember an instance where I had the contract read. They listen to the story of the agent and when they give you their confidence they swallow you whole. They know nothing about these nursery firms, but they ought to be educated up to protecting themselves; they should know the Mann apple is of no value and that strawberries won't grow on trees. I don't think L. L. May & Co. are altogether to blame. It is absurd to condemn selling through agents as our friend Pearce does. Of course the trees will die and they will have to be planted again and again. Not that I want to belittle this system of selling bogus stock, or this taking an order for something and then putting in anything you happen to have, but let us be sure about this; let us educate as far as possible through the association.

Mr. Hunter. Mr. President, I wish to say a word or two. I am not going to say a word against Mr. May or anyone. I live

in Sioux Falls, Dakota. I am one of the oldest settlers there; have been there seventeen years this spring, and during that length of time there have been hundreds and thousands of people who have immigrated from almost every state in the Union to our territory. These people have been anxious to get trees started and have purchased trees from different states. New York people have sent to New York state; Michigan people have sent to Michigan; and Illinois people have sent to Illinois, and when they have tested the trees have found two-thirds or three-fourths of them are worthless, or at least have produced no fruit. We deem it of the utmost importance to know where trees are grown, and the people of our territory are getting their eyes open on this subject. We don't want to purchase trees raised in the south; and I will venture the assertion that the majority of trees purchased the past two years and that will be, in the next five years in our territory, will be such as come from Minnesota, Northern Iowa and from Wisconsin. It is of the utmost importance whether they are grown in those localities or grown in the south, in Florida, California or some other place.

Mr. Bunnell. The trouble is, perhaps, that agents tell a good many things they are not authorized to do in order to get an order.

Mr. Cutler moved that a committee of five be appointed to take suitable action with reference to the matter under consideration.

Mr. Dartt. I would suggest that the committee report as to foreign companies canvassing for stock.

Mr. Cutler. I didn't intend that the report of the committee should have any reference to May & Co., but to the matter of misrepresentation.

Mr. Pearce thought Mr. May and all other parties should be left out.

Prof. Porter. Mr. Chairman, it seems to me that this Society, standing as it does, as a protector of horticultural interests, should not be made a machine for injuring any private individual. It strikes me that the report should contain nothing in regard to the firm of May & Co. I would therefore move that in order that no injustice may be done to anyone, that in the report of the committee and in the records of the association all reference to any nursery firm be stricken out up to the present time.

Mr. May. I thank you, sir.

Mr. Cutler. It looks to me that the adoption of such a motion would have the effect to strike out all the discussion on the subject.

Prof. Porter. I think the committee will act on general principles, and take such action as is calculated to protect the interests of the State and that will do no injustice to any individual firm.

Mr. C. L. Smith said in correspondence and in conversation in regard to this matter he had never been personal. He had not wished to do injustice towards L. L. May, but had protested against the introduction of eastern varieties, and new and untried varieties through unknown parties. He opposed no one individual, but everybody doing business upon that principle.

Prof. Porter thought it was difficult for the Society to say what should or should not be sold by a firm doing business from the Atlantic to the Pacific. They were not endeavoring to strike at individuals, but to get at the principle involved. He thought everything pertaining to individuals should be stricken from the records. We can hate the sin and still love the sinner. [Laughter.]

Mr. Harris. The Horticultural Society is an educator of the people. If there was any way to get at facts and leave out personalities, he would be glad to do so; but if the Society failed to let the truth go before the people, they were undeserving of the appropriation received from the people for the support of this organization. The Society was working in the interests of the people, and should let its light shine.

Prof. Porter presented the following:

Resolved, That while it is the province of this Society to collect and disseminate correct information upon all subjects relating to horticulture, and to protect in all ways possible the interests of the agricultural community, it is not their object or intention to injure in any way legitimate private enterprise; and that while retaining the substance of the discussions relating to tree agents, and foreign grown stock, the names of such agents or dealers, be omitted from the published report.

The resolution was adopted.

The chair appointed the following committee, viz., J. T. Grimes, J. S. Harris, O. F. Brand, A. W. Sias, D. Day.

The *ad interim*, or District Reports of the Vice Presidents being in order, the following reports were made:

REPORT FROM FIRST DISTRICT.

By A. W. Sias, Rochester.

Mr. President, Ladies and Gentlemen:

We will report on the apple first—the king of all fruits. Will say to begin with, that if you ever expect to make a croaker of your committee, you must stop sending him about the State looking up fruits, etc., for the more he wanders over this commonwealth, the more good fruit he finds and the more fully convinced is he that Minnesota is destined to astonish everybody in the amount of fine fruit she will at no very distant day be able to export.

Mrs. E. B. Jordon reports seven hundred bushels of apples for the past season, among which were some two hundred and fifty bushels of splendid Wealthy, many fine Duchess, Tetofsky, Russian Green, Peach apple, and other fine new Russians.

We estimate that J. Farrier, of Elmira, had some two hundred bushels of beautiful Wealthy apples, besides many other kinds in smaller quantities.

Wm. Somerville, of Viola, about 150 bushels, including some of the finest new sorts ever grown in this section. R. L. Cotterell 150 bushels; Page Bros. 100 bushels, largely Wealthy; many others in our district had full bearing orchards, but our time has been too much taken up with other duties to enable us to collect the statistics.

We have been most agreeably surprised; after the Wealthy was subjected to the low temperature of 50° below zero two years ago, and then last summer to the most severe drought ever experienced here since the first settler erected his log cabin, to find these trees in many places, as we have the past season on sunny southern slopes, completely loaded down with perfect fruit, was to us a most delightful surprise.

The leaf of an apple tree appears to be a safe index to its ability to withstand severe droughts, in windy, exposed situations, and also something of a criterion by which to judge of the hardiness of a tree—hence we are led to observe while the Wealthy has not as good a leaf for the climate of Minnesota as the Autumn Streaked, it has really a large, fine leaf. Leaves like those upon the Century plant and Live-for-ever are becoming a necessity. Having traveled considerably over the State the past season, and having noted the fact that the majority of the trees

set by our farmers were thin-leaved trees, grown in moist climates further south, if asked for the best piece of advice that I could give the Minnesota orchardist, I should say—set no more thin-leaved trees.

STRAWBERRIES.

With us the next thing of commercial importance to the apple is the delicious strawberry. The crop was unusually good and prices ruled fairly well, or at least higher than at any of the leading cities of the West.

The Crescent is still the leading variety, and if I judged by my own experience, I should place the Old Ironclad next; but from what I saw at other places, should be inclined to put Downer's Prolific second, Manchester third; many others were good and productive. Mrs. E. B. Jordon reports 11,000 boxes for their place. M. J. Hoag reports 6,500 quarts on one and a quarter acres. Wm. McHenry, St. Charles, reports the strawberry a poor crop, injured by the dry weather; not over one-fourth or one-half a crop; amount picked, 2,000 quarts. A. C. Ballard, of Rochester, had a splendid crop of strawberries, some three-fourths of an acre, yielding 3,750 quarts.

RASPBERRIES.

The raspberry crop about Rochester was immense, and I am sorry that I am able to give the figures from so few of our best gardeners. Some keep no account of what they produce; others promise to hand in the statistics, but fail to do so. Mrs. E. B. Jordon marketed 15,000 quarts; M. J. Hoag, 2,520 quarts on one and a quarter acres; A. C. Ballard, 2,214 quarts. Wm. McHenry writes: "Raspberries started for a very large crop, but the dry weather injured them fully one-half. Marketed 2,500 quarts. Turner is the most productive."

BLACKBERRIES.

Blackberry culture with our people is still in its infancy. We have just got the idea fairly through our heads that by covering our plants in the fall we can produce splendid blackberries in great abundance. Mr. McHenry says: "Blackberries did much better than strawberries and raspberries; were injured less by drought, though the last of the crop was small. Marketed 2,300

quarts." He says Stone's Hardy holds its own fully up, if not ahead of all the rest. The Thornless bore well without covering.

GRAPES.

Crop shortened up a little by the drought, but fair. Worden stands at the head, Moore's Early second, Delaware third, Concord fourth, Janesville fifth; Rogers' seedlings next.

Currant crop was good; Long Branch Holland among the best. Fay's Prolific fails to "pan out" as well as we anticipated from the high commendations of its introducers; it no doubt succeeds better further east. The Flowering Raspberry—or "Grapevine Raspberry," as the tree peddler has it—must be adapted to a dry climate, as it produced more fruit this season than ever before. The Russian mulberry crop, owing, perhaps, to the inclemency of the weather, was extremely light in our part of the State; in fact, I have not seen one of those large, luscious berries the past season.

I append the following report from M. W. Cook:

"ROCHESTER, MINN., JAN. 14, 1887.

"A. W. Sias, *President Olmsted Horticultural Society,*

"DEAR SIR: In compliance with your request to report amount and varieties of fruits grown by me this season I cheerfully comply with that request, although the varieties grown will fall short of previous years owing to the fact of selling a ten-acre lot containing the most of my raspberries and blackberries and a part of my strawberries, leaving me with only a newly set plantation of the above. I hope in good time to be able to make a favorable report of both yield and value received. Of strawberries my bearing beds are planted with the following varieties: Crescent, Downer, Ironclad, Pipers, Capt. Jack, James Vick, Glendale, Bidwell, Parry, Sucker State, Mt. Vernon, Cumberland Triumph, Wilson, Windsor Chief. All being planted in rows three feet apart; fully one-half of all my bearing beds are Crescents, which I consider the most prolific of any when well fertilized; and in order to secure that object I usually plant three to four rows of Crescent, then two to three rows of some perfect flowering kinds. From a field of 5½ acres of above varieties, planted in that way I picked this season thirty-five thousand boxes which were mostly shipped to various points in Dakota. The first shipments were billed 10 cts.; after

that at 8 cts. or \$1.92 per case of 24 quart boxes. Owing to late spring frosts my two acres of currants yielded only about 100 bushels. They were set four years ago and consist of the following varieties: Improved Red Dutch, Victoria, Prince Albert, White Grape, Long Bunch Holland. One-half an acre of White Grape was a marvel of fine fruit; all the above are good. Of raspberries, red, I consider Turner, Cuthbert and Brandywine the safest and best to plant, of which I picked about 1000 boxes from a new plantation, and 500 of black, mostly Ty-lers. At some future time if you desire it I will give my views on the different kinds of strawberries and raspberries and most practicable modes of culture.

Respectfully,
M. W. COOK."

REPORT FROM SECOND DISTRICT.

By E. H. S. Dartt, Owatonna.

MR. PRESIDENT: I have no written report. If I say anything I think my report had better be confined to Steele County, because you have heard from me before now as reporting from that county, and perhaps would understand me better in that way.

Our county is situated, I suppose, some five hundred feet higher than St. Paul. I think water runs from our county in every direction — south, towards Iowa; east, into the headwaters of the Zumbro; north, into the Strait and Cannon Rivers, thence into the Mississippi. That gives us a high elevation. The bulk of the land in the county descends a little to the north, or is drained by Strait River. There are no elevations that are very much above the general level; valleys are comparatively shallow. It has been found that high lands, in order to be favorable for fruit growing, must be in the vicinity of considerably lower lands. Where there is not much difference in altitude, where lands are all high, it is considered rather detrimental to successful fruit growing. That is our situation.

I will say in regard to small fruits that I believe there has been generally a fair crop produced in our section. We have been troubled considerably by drought, and I have no doubt the crop was diminished; but that not being my hobby, and the apple tree being my hobby, I will report most in regard to that.

The condition of apple trees previous to 1884-5 was various.

Among varieties of the standard apple nearly all of them seemed to be in rather a precarious condition; were gradually dying out; that is, such as Haas; Saxton was gone many years ago, also Ben Davis; Peach apple was growing fairly up to that time, but had never borne scarcely any; Wealthy was doing well; Tetofsky had died partially, some of them had died previous to that, and some Duchess, where on low grounds.

After that time all half-hardy kinds seemed to be finished; every Haas, every Wealthy, and all of that class, were either dead or as good as dead. Out of eight hundred Wealthies in orchard, which had been set and received good care, not one sound tree was left, and barely half a dozen had life enough remaining to produce apples at all. Most of the trees sprouted again from the root, and with a succession of warm winters there may be hope of getting apples yet from those trees.

About three-quarters of my Tetofsky were killed out, and we may count one-fourth in fair condition, but those are where they have had the best care and stood in the most favorable location.

Previous to that time I heard of many seedling apples in that section of country that were recommended as valuable, which were represented as bearing good crops, and it was thought we might look for something valuable from these seedlings. Since that time I have not heard of but one seedling that is represented as being hardy; I refer to standard apples. That variety was grown on the north line of Steele County, and I think the apple is on exhibition here.

Of other seedlings I have raised some. One that I call Dartt's Hybrid is a seedling of Tetofsky, and the trees are growing fairly. It is a fine nursery tree; and the only doubt of its being eminently successful and valuable is that it may not prove a heavy bearer. The original tree bore two bushels a year ago last season, but last season did not bear. I think it is a little hardier than Whitney, fruit about the same size and about equal in quality.

The fruit crop last season, considering all these discouraging points, was remarkably good. Our Owatonna market was supplied for I think nearly two months in the early part of the season with apples grown in our neighborhood. I raised most of Duchess, of which I sold four hundred and fifty bushels; my crop would amount to at least five hundred bushels. The apples in the market referred to were Duchess and Transcendents.

In regard to Russian varieties would say we had a large list of

them under cultivation prior to 1885, and I had a good deal of faith in them, but that winter was too much for nearly all of them.

My own apple crop was very much diminished by the damage done by insects; in one orchard I think that fully one-half of the apples were destroyed by being knotty; they commenced falling early in the season, and those that staid on became very ill-shaped, many falling later in the season, or were in that condition when gathered. I lost fully one hundred and fifty bushels in that way. I don't know what insect did the mischief; perhaps some of our friends can tell us a remedy. I have thought of trying arsenic and water.

DISCUSSION.

Prof. Maginnis. How are the trees doing in the new orchard?

Mr. Dartt. On high grounds, where well cultivated and manured, they are doing well. South of the railroad trees have always done poorly, and I suppose that to be the coldest spot that can be found anywhere around there.

President Elliot. Is the planting of trees in your section on the increase?

Mr. Dartt. There is general discouragement throughout our section of the country. Nearly all the farmers say they would rather raise wheat at a low price than to bother with apple trees. Others say they shall continue to plant out orchards or fill the place of missing trees.

Mr. Gilpatrick. You stated that the portion of your orchard that you had cultivated and manured had done well. What do you call good cultivation?

Mr. Dartt. Plowing and dragging in the spring. My practice has been to manure heavily in opposition to the general theory that prevails, and I have heaped it on, and think there have been beneficial results from this method; trees that I set sixteen to eighteen years ago are in fair condition. The manure keeps up the vitality of the tree and prolongs the life and promotes its bearing qualities.

Mr. Pearce. Have you made any money from your orchard?

Mr. Dartt. I have made some money. My orchard is Duchess and Tetofsky, and it has paid me better, I believe, per acre than any other land that can be found in Steele County that has been used for any other purpose. I have kept account of my apples

and I estimate that my orchard of 18 acres has netted me about \$300 or \$400 per acre, clear, besides trouble and expense and the cost of the land at \$100 per acre. I have a new orchard set since the hard winter, with 500 Duchess.

Mr. Jenkins. What have you fruited this past season?

Mr. Dartt. It is hard to tell. Most of the fruit grew on four acres.

President Elliot. What is your method of planting?

Mr. Dartt. I plant rather shallow, about the same depth as in the nursery. But plowing towards the rows has caused the trees to stand on ridges. They were in nursery rows and thinned out afterwards.

REPORT FROM THIRD DISTRICT.

By M. Cutler, Sumter.

Mr. President, Ladies and Gentlemen:

It gives me pleasure to meet with you once more. This is a place where we, the lovers of fine flowers, fruits and vegetables, meet on a common level to receive and impart information that will be of value to us, as well as the thousands of tillers of the soil throughout this great northwest, who are not present. As I come from the great prairie west of the Big Woods my report will necessarily pertain mostly to that section. Since our last meeting I have succeeded in organizing a county horticultural society in McLeod County. While we have not met with the success we hoped for, we do not propose to give it up yet; remembering the early history of our State Society, which we now consider a great success, we shall persevere. As to our work the past year and present standing I refer to our secretary's report.

The exhibit of vegetables and fruits at our county fair was probably the best ever made. That of vegetables was said to equal that made at the state fair. The grand display was no doubt the result of offering liberal premiums for the best display of farm products. One man entered over eighty kinds of fruit, grain and vegetables.

Wild plums and grapes were abundant the past season.

STRAWBERRIES

owing to the drought were not as fine or abundant as usual. The best were on low land and where huge snow drifts covered them

during the winter. Crescent and Glendale stood the drought and produced the best. A row of Jas. Vick produced well. Wilson and Old Ironclad were a light crop. Jumbo and Sharpless produced a crop of very large, fine berries. Jumbo is too soft for shipping. A Frenchman living in the Big Woods near Winsted lake had about 4,000 quarts of Wilson and Crescent from seven-eighths of an acre. The average market price in our county was about ten cents.

RASPBERRIES.

Turner, Cuthbert, Doolittle and Gregg raspberries produced a fair crop; price, 12½ to 15 cents.

A new seedling red raspberry lately introduced in our county attracted considerable attention the past season. It is called the York State Sweet. In answer to questions addressed to the originator, I received the following information: He set in rows six feet apart, hills two to three feet apart, among apple trees, on a southern slope. No winter protection has been given them during the past seven years, and they have never winter-killed. From a patch three by seven rods forty dollars' worth of fruit was produced. It seems to be a promising variety.

My Stone's Hardy blackberries that were covered with dirt during the winter bore a good crop, but the quality was not number one. I think the hot, dry weather injured the quality and made them look as though they were scalded. Query: Is this berry generally of good size and color? A few neglected canes of the Snyder and Taylor's Prolific produced nice berries.

I purchased five hundred plants of the Ancient Briton blackberry of Mr. Hamilton. Owing to the spring weather coming on so much earlier than it did at Ripon, they did not arrive until the ground got pretty dry, which, with the aid of cutworms, caused two hundred plants to die. Some of those that lived seemed inclined to trail on the ground instead of growing upright. Query: Is this the habit of the Ancient Briton? A few dewberry plants owned by myself and Mr. Crandall produced some of the largest and finest berries in the blackberry line I have seen. Question: Can any member present give us any information in regard to the hardy dewberry advertised by Dewain Cook?

My Red Dutch and white currants produced a fine crop. But few grapes are grown west of the Big Woods. Concord, Rogers, Salem and Janesville produced good crops where properly cared for.

Transcendent and Hyslop trees bore well, but the fruit was smaller than usual. One of the nicest sights that greeted my eyes the past season was several nice, healthy, sweet crab-apple trees from ten to fifteen feet high, well loaded with light-colored apples, about the size of large Hyslops; some had a slight blush on one side. They were very sweet, crisp and juicy, nice to eat out of the hand or bake. I do not know the name of the variety.

TREE AGENTS.

But few swindling tree peddlers invaded our county the past season. Probably the worst one was a man by the name of Jordan, representing May & Co., of St. Paul. His principal hobbies were tree gooseberries, represented by a photograph of a gooseberry with a fifty-cent piece in front of it, the berry being larger round than the money;—when the buyer gets his berries he may think the money he paid for them was the largest;—Thornless blackberry and Gideon apple trees, at one dollar each. I have heard of a few who gave him a small order just to get rid of him. Better let loose the watch dog and cry "sic 'em!"

The farmers who invested so heavily in Albaugh & Co.'s budded trees found when spring opened that most of their dollar trees had given up the ghost. One of my neighbors who invested five dollars in them, hearing that some of his neighbors had found most of their trees dead concluded that his trees would do as well to remain in winter quarters and left them there. Still there are men who say that this wholesale robbery of our people serves them right, that they should all come to the meetings of this Society and get better posted. Experience and observation have taught me to beware of the stranger who promises much for little, for they work for big pay, and not for the benefit of the people. I believe our people can raise all the fruit they need for home use, but do not advise farmers west of the Big Woods to invest their money in any apple trees but the best of the crabs and hybrids.

I have received some interesting letters from correspondents which I will read. The first is from Charles Kenning, of Bird Island, Renville County. He says: "In reply to your letter I wish to say that but little fruit is grown here except what is grown by Dr. Puffer and myself. I am growing several varieties of currants; the common Red Dutch did splendidly. Of raspberries the Turner does well. Champion and Miner strawberries

bore a fair crop; Crescent a good crop; Wilson and Glendale, also Monarch, medium. The plants were received from Charles Luedloff and were set out the latter part of May, 1885, on ridges made with plow and hoe. The season was late and dry and I received the plants about three weeks before setting them, tied in bunches. They were put in the ground until I could find time to set them out; of three hundred plants I lost but six. When I planted them I used the following method: After making the ridge and removing all lumps, I set in rows two feet by five, walking over the rows with a pair of wooden shoes until the ground was well packed, watered while planting and no more. I kept them well cultivated until the middle of August, after which I let them take care of themselves until the ground was frozen, when they were covered with slough hay about four inches deep; in the spring they showed a nice matted row and bore a good quantity of well-formed fruit. After fruiting I plowed out the middle, forming a ridge and leaving a row of plants from two to four inches wide, letting them run, and kept the ground clear from weeds. The ground in the fall was covered with nice young plants which were again covered with slough hay. This is my first attempt to raise berries or fruit and I have been very successful. My apple trees that I planted last year, some forty of six varieties, have made a good growth of well-matured wood. Of plums I have growing Weaver, Forest Garden, and De Soto; all doing well, but none fruited; all planted in 1886. My ground is all new and well drained. I will plant more next spring; shall try a few more varieties of strawberries and also try blackberries. Yours,

CHAS. KENNING."

"*M. Cutler, Esq.,*

DEAR SIR: Yours of the twenty-seventh finds me extremely busy, and the few notes herein contained constitute a very meagre report, but it is the best I can do for you now. Please take the will for the deed.

BEACH'S SWEET CRAB

will always occupy front rank in my regard for the following reasons: It is a rapid grower and fruits early and abundantly; it is hardy, free from blight, and the quality of the fruit second to none; fair specimens will measure one and three-fourths

inches in diameter, very smooth, and a beautiful high crimson color, the flesh almost cream-colored; and is crisp, tender, and the sweetest apple known to me. Nothing will equal it for sweet pickles.

GRAPES.

Rogers' Hybrids, Delaware and Janesville, very fair crops. Concords in some vineyards cut by frost. On many vines of Brighton and Agawam a second crop of fruit was produced so early as to get full growth before frost. Query: Can as good a crop be expected the coming season on this account?

GOOSEBERRIES.

Only a third of a crop.

CURRANTS,

cut by late frosts, gave about half a crop. Fay's seedling is all and more than has been claimed for it. Black and white both fruited more freely than the red.

RASPBERRIES.

The Clark and Philadelphia gave a full crop; no protection, except plentiful mulching. Cuthbert was caught by extreme drought. Blackcaps, especially Gregg, were fine. Have learned by experience that it pays to cover canes with straw in November, not heavy enough to break canes, but sufficient to cover carefully, working it in under the canes in the spring for mulching.

STONE'S HARDY BLACKBERRY

was among the most profitable small fruits handled in 1886. All blackberries should be protected in this latitude. Light straw mulching answers every purpose. This, with coarse manure and litter worked well in under and about the bushes, serves the double purpose of choking weeds and grass and keeping the ground moist during the scorching days that, as a rule, are to be expected in August.

With prices for Stone's Hardy at twenty cents per quart, and at this price with abundant yields that this variety always gives under proper cultivation, it is safe to estimate on five hundred dollars to the acre in the gross.

Trusting your session may be a profitable one,

I am, yours truly,

S. M. EMERY."

"LAKESIDE, JAN. 6, 1887.

M. Outler :

DEAR SIR: Yours of the 27th ult., is just received. I have been quite successful with small fruits. Concord grapes bear fairly well each season, but of course have to be laid down in the fall. We have the White Grape currant which bears heavy crops of fruit each season with but very little attention aside from mulching. We have the blackcap raspberry that gives us an abundance of fruit each season without any protection or other special attention aside from pinching back and a light coat of mulching each season after the fruit has ripened. My straw berries do best without mulching, as they are located near a wind break and are covered with snow the winter through. Hyslop and Transcendent crabs do well with us, and when ashes are placed around the roots of the trees, no blight is perceptible; not so treated, blight more or less.

Yours truly,

M. T. REDOUT."

On motion of Mr. Harris the Society then proceeded to the election of officers for the ensuing year.

ANNUAL ELECTION OF OFFICERS.

The following list of officers was then elected, to-wit:

President — Wyman Elliot, Minneapolis.

Vice Presidents — A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; M. Cutler, Sumter; N. J. Stubbs, Long Lake; and G. W. Fuller, Litchfield.

Secretary — S. D. Hillman, Minneapolis.

Treasurer — J. T. Grimes, Minneapolis.

Executive Committee — J. S. Harris, Chairman, La Crescent; J. M. Underwood, Lake City; D. Day, Farmington; F. C. Gould, Excelsior; I. Gilpatrick, Minneapolis.

Librarian — E. A. Cuzner, Minneapolis.

Entomologist — Prof. O. W. Oestlund, Minneapolis.

The following were named as a Committee on Publications: Wyman Elliot, S. M. Owen and S. D. Hillman.

On motion of Mr. Harris, Worthington was designated as the place for an additional experiment station, with J. H. Ludlow as superintendent.

On motion of Mr. Smith, Fergus Falls was named as an experiment station, with M. T. Duncan as superintendent.

On motion of Prof. Maginnis the executive committee were directed to name the members of the additional committees to be selected hereafter.

Mr. Harris presented the following, and moved its adoption:

Whereas, Our State has a great diversity of soils, elevations, aspects and exposures, and consequently diversity of climate, requiring persistent and long continued experiment in order to establish a solid basis for successful fruit culture; therefore,

Resolved, That we ask the legislature to establish an additional experimental station on the state school farm at Owatonna, and that we recommend the appointment of Mr. E. H. S. Dartt of said city, as manager of the same.

DISCUSSION.

Mr. Pearce. I don't think it is necessary to open another institution of that kind to be supported by an appropriation by the State.

Mr. Harris. It would come under the management of the board of regents of the state university.

Mr. Sias. I am in favor of this proposition. In fact it seems to me that Owatonna is just the place for such a station; as Mr. Dartt has shown us, it is the height of land in all that section of country. His reports for many years past show that it is a very hard place to grow fruit, and anything that would prove hardy there would prove hardy all over the State. Almost everything tried there has failed, and for that reason I would like to see a station located there. Give him a fair chance to test all these different hardy varieties in that exposed location.

Mr. C. L. Smith. This is a step in the right direction. I don't care whether the State appropriates \$10, or \$100, or \$500, the money can be well expended. In connection with the school at Owatonna a horticultural station would be a grand, good thing, and if no other benefit is derived the horticultural education afforded the pupils would be worth more than the expense required. The fact might be stated that it is similar to the station at Minnetonka, and the objection might arise that has been urged against the management of that station. I don't care to discuss that at all, for I think Mr. Dartt could manage it in a different manner. But if he did not, still so far as an educational station in the direction mentioned, it would be a good thing and worth much more than its cost.

Mr. Pearce. It seems to me that is the most unfavorable place in the world for trees. Mr. Dartt will say that he has

failed with everything—that the Duchess won't do anything. Steele County is, perhaps the worst place in the State for fruit trees, and what is the use of putting anything there for trial if it won't grow? It would be a failure.

Mr. Dartt. There is one part of the resolution perhaps that I could speak to; that is the first part. So far as failure is concerned I would say that I have met all these gentlemen at our state fairs and have taken perhaps my full share of premiums at those I have attended. At the last state fair at Owatonna I took the first premium on the best ten varieties of apples adapted to Minnesota; the first on the best six varieties; the first on the best plate of Duchess, besides other premiums. That would seem to indicate that it is possible to raise fruit at Owatonna. Admitting that it is the hardest place for fruit in all that section of the State and that it is as hard as any much further west, it seems to me a good reason why a station should be located there. Whatever we could raise there successfully would be thoroughly tested as to hardiness. It could be depended upon in trying situations. Some localities in different sections are more favorable than others. For instance, a northern slope, on high land in the vicinity of low land, especially with a sweep from a lake surface, might be a favorable location for fruit when otherwise it might be considered unfavorable.

Mr. J. M. Smith. I rise to endorse what the last gentleman on the floor has said. We have tried experimenting in Wisconsin a good deal, and it strikes me the opinions urged by Mr. Pearce, if correct, are really the strongest ones why such a station ought to be established at such a place. If you have the means to do this and do not do it, is it not equivalent to saying, "You are in a God-forsaken region where nothing can grow and we will let you go to your own destruction?" I don't believe there is a spot so bad in Minnesota but you will eventually raise fruit. I don't expect to see it myself but those days are bound to come, and the quicker you go to experimenting as to what succeed the quicker that fruit will come. When you succeed in such a place as this it will be something worth while and worth much more than the expense required.

Mr. Harris. Mr. President, I feel that it is the duty of our State to foster horticulture; every dollar expended for that purpose will bring a return a thousand fold to the generations that are to come after us, if not in the immediate future. The reason why I favor Owatonna for such a station is because the

State has a farm there. Mr. Dartt is a practical nurseryman who lives there and has shown by the premiums he has taken from time to time that he has the skill to handle such a station, and he would be the right man to superintend it. It is important that these experiments in fruit culture should be carried on in different parts of the State.

Mr. Pearce. I cannot exactly understand how Mr. Dartt can take all those premiums and raise hundreds of bushels of apples and still live where apples won't grow.

President Elliot. I did not know this resolution was to be brought up, but it seems to me a move in the right direction. If we have a school at Owatonna for indigent children, under the instruction and care of the State and fostered by it, it seems to me just the proper place to put an experimental station and a good place to teach the rudiments of horticulture in a practical way. I don't know of any man in that section of the State better qualified than our friend Dartt to undertake the work; he has had eighteen years experience there and would do better than a person who had no experience.

Mr. Cutler inquired if this farm was not in the city where boys would be likely to gather the fruit.

President Elliot said the boys were supposed to be under restraint; while at Minnetonka people came there for pleasure and there was little protection from the fruit being stripped on the experiment fruit farm there.

Mr. Stubbs thought this a move in the right direction, and had heard no reasons urged why the new station should not be established. If Mr. Gideon gave up the fruit farm there should be another one selected elsewhere.

Mr. Sias said he would not wish to do anything that would interfere with the stability of the station at Lake Minnetonka, or have anything done to jeopardize or supplant it in any way.

The resolution was then unanimously adopted.

The following paper was then read:

PROPAGATING BY GRAFTING, BUDDING AND LAYERING.

By J. S. Harris, La Crescent.

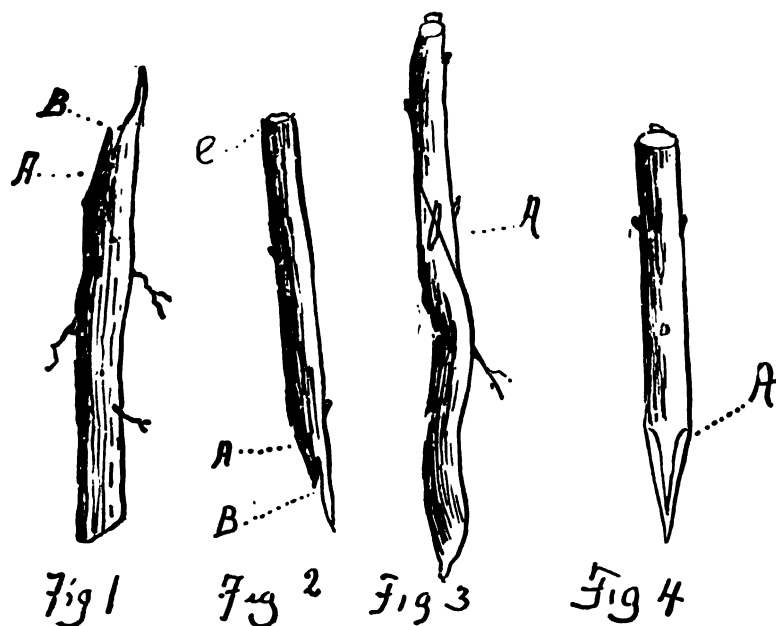
Seedling fruit trees are now seldom used for planting orchards, except in countries where the rudest systems are in vogue, and in new countries where the first settlers have not the means for purchasing grafted varieties or are so remote from commercial nurseries that they cannot be transported safely. The principal reason for this is, that varieties rarely reproduce themselves from seeds, therefore seedlings are grown for two purposes only, viz: to secure stocks for grafting established varieties upon, and to obtain new varieties. For growing stocks to graft upon it is the custom of many of our nurserymen to procure their seeds from the east which is saved from the pomace of the cider mills where the poor and immature fruits of weak and tender varieties are promiscuously ground up together. It would be much better if they would select the seed from perfect, well-ripened fruit grown upon healthy vigorous trees with sound constitutions. Were this practice followed for a length of time in this state I doubt not we might get back to the long lived, healthy and fruitful trees of the olden time.

It is obviously impossible for an unhealthy, feeble tree to produce sound and healthy plants from their seeds, and it is evident that from some cause our fruits are getting to be short lived and more subject to blight, mildew and other diseases. In growing seedlings for the originating of new varieties still greater care should be exercised. Experiment is demonstrating that the seed from new or ingrafted is more certain to produce a hardy and vigorous tree than the seed of old, long-propagated varieties. The stock is supposed to exert considerable influence upon the tree which will manifest itself in the seed of the fruit and if this be the case it would be well when we wish to grow seedlings from grafted varieties to first get the varieties upon their own roots, which may be done by layering a branch and when it has taken root it can be separated and will become a tree upon its own roots. Another method is to induce the tree to form roots by deeper planting above the point where grafted and afterward remove all roots of the foreign stock. Only the most perfectly developed fruit should be used from which to save the seed. When by this method we have suc-

ceeded in obtaining a valuable variety we can rarely reproduce it from seed, therefore to multiply it we resort to artificial processes.

If placed under favorable circumstances every bud upon a tree is capable of producing a new tree like that which it was taken from; the knowledge of this fact makes us able to multiply and disseminate new and desirable varieties with great rapidity. The methods now practiced, grafting, budding, layering cuttings and suckering, or division of the plants; or the production of a tree from a bud, graft, layer or cutting, is the same thing in effect, brought about by different methods, but all trees will not conform to the use of the same methods, else all propagation would be done by cuttings.

In propagating by cuttings, the cutting is put directly in the ground where it forms roots. The cion and bud is nothing more than a cutting, but is inserted in or upon the wood of a like



specie, where it unites with the wood of the stock; the difference is that one draws its support from the ground and the other through the tree to which it unites. In all cases it is a part of the parent plant and may contain one bud or several.

The apple, pear, plum and cherry seldom succeed from cut-

tings planted in the ground, hence they are propagated by other methods, grafting and budding being the most common. The process of grafting consists in the insertion of a cion of one variety or specie into or upon the stem or branch of another which is called the stock. Cions are generally made from shoots of the previous year's growth, but sometimes those bearing fruit buds are used for experiment. They should be cut in the autumn, after the fall of the leaves, and carefully preserved through the winter by burying them in a pit in dry, sandy soil, with earth so piled over them as to turn water; or they may be kept in a cool, dry cellar, packed in sawdust, or some other material, to prevent shrinking of the bark. If kept too moist they will decay; if too warm the butts will callous over, which will weaken their vitality, and renders cherries and plums worthless. A moderate sized shoot, or cion, if well matured, is better than one that is large, pithy and unripe. Only perfect cions should be used, or incipient disease is started that no after treatment can eradicate.

Two methods of grafting that are most generally practiced, are, viz: whip grafting and cleft grafting. Whip grafting is the method mostly practiced in root grafting in nurseries. For this

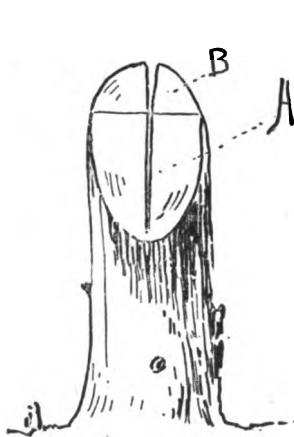


Fig 5

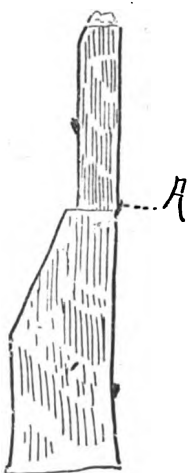


Fig 6



Fig 7

purpose seedling stocks one or two years old are generally used of one-fourth to three-eighths of an inch in diameter. These seedlings are better for being dug in the fall and buried in the

cellar, or a dry bank outside, where they can be got at early in the spring.

The graft should always be made at the collar, and therefore the stems of the plant are cut away at that point when they are dug. When ready for grafting, first trim back the small top roots and cumbrous laterals, leaving the stocks six to eight inches long and wash them clean. (Our western nurserymen are accused of using shorter stocks and making two or more from each seedling root, a practice which has, I think, many objections.) The grafter then makes a smooth, sloping upward cut an inch long on the collar of the root (A Fig. 1), and in the center of this cut he makes a downward slit, or tongue (B Fig. 1). The cion, which should be three or four inches long, is cut on the lower end with a sloping, downward cut (A Fig. 2), and similar in every respect to that made on the stock; an upward slit or tongue is made in it (B Fig. 2) corresponding also with that on the stock, and they are then fitted together—the tongue of the one within the other (A Fig. 3)—and the inner barks of both placed in close and perfect contact, at least on one side. The fits should be so complete as to set close and firm at all points.

The next operation is to apply the wax, which is usually done by winding firmly with waxed thread or narrow strips of waxed cloth. I do not use wax on root grafts, but wind them with fine carpet yarn, and find it better than the old way.

Whip grafting on small trees standing in the open ground, and on the small branches of larger trees, is performed in precisely the same manner, but greater care must be exercised in waxing them, to protect from air and water.

The grafting of nursery stock is usually done in the latter part of the winter, and the grafted plants are put away as closely as they can be packed in small boxes, with sandy earth or sawdust among the roots, and deposited in a cold cellar, but where frost cannot penetrate, until planting time.

Cleft grafting is practiced on trees or branches too large for whip grafting, say from three-fourths of an inch upward. In this case the base of the cion is cut precisely in the form of a wedge (A Fig. 4). The part for insertion in the stock should be about an inch or an inch and a half long with a bud (A. Fig. 4) at the shoulder, where it is to rest on the stock. The bud hastens the union of the parts in the same way as a bud at the base of a cutting set in the earth hastens and facilitates the formation of

roots. The outer edge should also be somewhat thicker than the inner.

For grafting in the trunk of the tree it is cut or sawed off horizontally, and if the stock is not too large, a sloping upward cut is made upon one side, about an inch long, and to the center (A Fig. 5). The stock is split just one side of the pith (B Fig. 5) by laying a knife or chisel on the horizontal surface and striking lightly with a mallet; the split is kept open with the knife or chisel until the cion is inserted, with the thick side out (A Fig. 6).

Large stocks or branches are sawed off in the same manner (A and B Fig. 7); the surface is then pared smooth with a knife, a split is made with a chisel nearly in the center and held open with a wedge until the wedge-like cions (A Fig. 4) are inserted (A B Fig. 8.) If they both grow and are afterward too close,

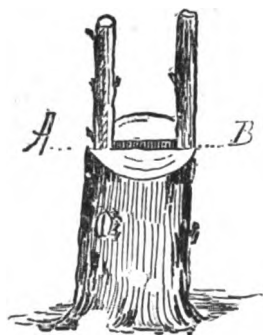


Fig 8.



Fig. 9.



Fig. 10.

one of them can be cut away. The points to be observed for successful grafting are: Sharp instruments, which will make smooth, clean cuts; perfect contact of the inner barks of stock and cion, and covering the whole cut surface and every portion of the split with wax, to exclude air and water. Where convenient the wax may be put on while melted with a brush, or it may be put on with the hands.

The implements required in whip grafting are: A pruning knife, to trim up the roots, and a thin, sharp knife for shaping the ends and cutting the tongue in cion and stock. For cleft grafting, in addition to above, a sharp, fine saw and grafting chisel with wedge attached, and for large trees, a step-ladder.

Grafting composition is prepared in various ways. We gener-

ally use two parts of resin, one ounce beeswax, one ounce of tallow, melted together, poured into water to cool, and when cool enough worked with the hand, well greased to prevent sticking. If the weather is so cold when used that it will not spread, it may be brought to the right consistency by keeping it in a bucket of warm water.

PROPAGATION BY BUDDING.

Among the various methods of propagating varieties of fruits, no one is more simple or easily performed than budding. The operation is performed during the growing season, and usually upon trees having smooth, soft bark, and from one to five or six years old, but may be successfully performed upon trees of any age that are thrifty. For older trees grafting is a preferable method.

The operation consists in separating a bud with a portion of bark attached (see figure 9) from a shoot of the current season's growth, and inserting it below the bark of another tree or shoot and tying it in place with a string of baste matting, cotton or wool. When the bud begins to grow all that part of the tree or branch above the bud is cut away, so from the budded point up the tree will produce the same variety of fruit as that from which the bud was taken.

The season for budding in this region is between the middle of July and the first of September, the time depending upon the species and conditions of growth. Any variety that completes its growth early in the season, should be worked early, and such as continue to grow late in the autumn may be worked much later. Buds may be inserted in June (or as early as the bark will part freely from the wood), by taking the bud from cions cut the previous fall and kept dormant, but fresh while they are to be used; they will make considerable growth the same season, but this is hardly desirable except with varieties that are scarce. In my practice I have found them inclined to continue their growth later into the autumn and thus they do not get ripened up as well for enduring the following winter. When done in the proper season, the buds remain dormant until the following spring.

To make budding a perfect success, certain conditions have become necessary. First, the buds must be perfectly developed in the axils of the leaves upon the young shoots intended to bud

from; this is not usually the case until the first growth of the season is accomplished and the shoot has temporarily ceased to lengthen, as indicated by the perfect formation of the terminal buds. Second, the bark must rise freely from the stocks to be budded. This it will do only when the trees are in a thrifty, growing state; never after the growth of the season is completed.

Where buds are wanted before this condition of maturity, we sometimes hasten it by pinching back the tips of the shoots, and after a few days the buds will be fit for working.

TO PREPARE THE BUDS.

Shoots in the condition described and of the variety desired are removed from the tree at a point below the lowest plump bud; the leaves are then cut away, leaving a half or more of

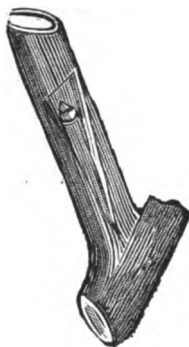


FIG. 11.



FIG. 12.

each leaf stalk to handle the bud by. Then the shoot to be budded from is taken in one hand and the knife in the other, the lower part of the edge of the knife is placed on the shoot half an inch above the bud to be removed; the thumb of the knife-hand resting on the shoot below the bud, a drawing cut is then made parallel with the shoot, removing the bud and the bark to which it is attached half an inch above the bud and three-quarters below it. The cut is made just deep enough below the bark to take a small portion of the wood with it, and if this adheres firmly it should be allowed to remain; if it parts freely it should be taken out, but in doing so the root of the bud should be carefully preserved, for if it comes out the bud is useless.

A smooth place on the stock to be budded is then chosen, where incisions are made just through the bark, one across the other so as to form a T, the bark on the two edges of the perpendicular cut is carefully raised with the smooth ivory handle of the budding knife, as shown in Fig. 10, and the bud is inserted between them; the upper end of the bark attached to the bud is cut square to fit the horizontal cut on the stock (see Fig. 11). The string is then wound around tightly, commencing at the bottom and covering every part of the incision, leaving the bud itself and the leaf stalk uncovered (see Fig. 12); the string is fastened above the horizontal cut, and the work is done. The success of the operation depends in a great measure upon smooth cuts, an exact fit of the bud, close tying, and the expedition with which it is done.

In ten days or two weeks after the buds are inserted they should be examined, and such as have failed to unite may be budded again, if the stocks have not finished their season, so that the bark will not lift. In about two or three weeks the strings should be taken off. Early the next spring, or as soon as the buds begin to start, the stocks should be headed down to within three or four inches of the buds, and all buds starting above or below them should be rubbed out. About the first of August the portion of the stock left above the bud at the time of heading down, should be removed with a sloping cut, smooth and close at the highest point of union between the stock and bud.

Nearly all of our fruit trees will do as well to be budded as grafted if the stocks are perfectly hardy, but the operation does not make them any hardier. All varieties that do not split straight, like our native plum and the cherry, are more sure to grow than when cleft grafted but not when whip grafted.

PROPAGATING BY CUTTINGS.

A cutting is a shoot or part of a shoot, generally of one season's growth. The length may vary from a single eye or joint to a foot or more, according to the nature of the species, or the circumstances under which they are to be grown. For the best success, the wood should be as stout and mature as possible and should be cut close and smoothe to a bud or joint at the lower end. In our experience, cuttings taken off close to the old wood with the base attached have proved much more successful than

when cut at several joints above, and in many cases, where an inch or so of the old wood is left attached to the base they will be all the better. In this country cuttings should be prepared in the fall, and be buried in the earth out of doors for the winter, out of the reach of frost and carefully mounded over to throw off water. They should be planted very early in the spring or as early as the ground is in good condition for working, and, as a general thing, so deep that but one or two buds will be above the surface of the ground. At the time for planting, trenches are opened with a spade as deep as necessary, and the cuttings set in at the proper distance apart. When the cuttings are in the trench, the earth is partly filled in and trod firmly down with the foot, then the balance is filled in and leveled up. If cuttings are long they may be set sloping so as to be within the reach of heat and air. This method of propagation is peculiarly well adapted to the grape, currant and goosberry, as well as to many ornamental trees.

LAYERS.

The layer is similar to a cutting except that it is allowed to remain in partial connection with the parent plant until it has emitted roots. On this account layers are more certain than cuttings, and frequently considerable time is gained in fruiting. It is the best method for propagating the grape and goosberry. It may be performed in the spring with shoots of the previous year's growth, or in July or August with shoots of the same season's growth. The ordinary method is to spade the ground where the branch is to be laid, making it light and pliable. The branch is then brought to the ground and an incision made on the lower side, below a bud, through the bark and partly through the wood, and the knife is drawn upward splitting the shoot an inch or two in length; then the branch is laid in the earth with the cut open and pegged down with a hooked stick and the soil drawn smoothly over to a depth of two or three inches, with the end of the branch remaining out of the ground. After they are well rooted they should be severed from the the parent plant and are usually ready for transplanting the following spring.

SUCKERS.

Suckers are sprouts springing from the roots of trees and plants. They are oftenest found around trees where the roots have been injured by plowing or spading. The wounds conduce to the formation of buds, and these buds send up shoots. They are occasionally used for stocks to graft upon, but owing to their tendency to produce suckers should never be used when seedlings can be obtained. Our native plums are a little difficult to propagate by grafting, hence we frequently recommend our farmers to increase the best varieties by this method. If taken off when small and kept a year or two in nursery, they make fine trees with good roots. It is also the usual method of propagating blackberries and red raspberries.

DISCUSSION.

Mr. Pearce inquired why it was necessary to use long roots.

Mr. Harris said the sooner the practice of using longer hardier roots with short cions prevailed, the sooner would we get trees that would stand in all parts of the country.

Mr. Dartt thought an inch and a half root for grafting not long enough; if longer, it would go deeper and not dry out so easily. The reason trees leaned was because of prevailing winds, and it was often difficult to get well balanced trees where they were exposed to heavy winds.

Mr. Underwood thought they could be by trimming; he practiced cutting the limbs from the leaning side. He favored using long roots for grafting. He had tried crown grafting, but had not seen results to warrant the practice.

Mr. C. L. Smith recommended Duchess, Wealthy and Whitney for grafting, using roots four inches long and cions five to six inches, and was opposed to crown grafting.

Mr. Sias said he had experimented on grafting in different ways. Formerly he used long roots and short cions; his rule now, after twenty-five years' experimenting, was to get strong roots and cut them not over two inches in length, using cions about six inches long, and planting deep. He had visited a nursery some twenty-six years ago in Indiana, where they propagated entirely by layering; the results were the trees grew at an angle of nearly forty-five degrees, and were no hardier than those grown in the usual manner. By using long cions in grafting, they would take root, and the trees produced would be hardier and more thrifty.

Mr. Harris said it had been demonstrated that the roots of some varieties were hardier than others, and that was why long cions were to be preferred to short ones for grafting.

President Elliot said the fact was we grafted on tender stock as a rule; some recommended crossing on hybrids for hardy roots. It was necessary to go back to seedlings to propagate successfully, as by continued grafting from the same stock it would deteriorate after a while.

Mr. Sias thought there was some question whether stock would deteriorate. The Baldwin was originated about a hundred years ago; had been grafted extensively, and there was nothing ahead of it. The same thing might be said of the Wealthy, so far as tested.

Mr. J. M. Smith said the bearing life of trees in the East was much greater than it is here. They have trees there a hundred years old that are still in bearing.

Mr. Harris thought it was best, if practicable, to go to the original tree for cions. The quality of Baldwin apples in the market varied a good deal.

Mr. Pearce favored using Duchess and Wealthy for grafting, they were much hardier than seedlings.

Mr. Harris said for nursery purposes it was not practicable to raise trees from root cuttings, but they made nice trees. Any variety hardy enough to stand the winter of 1872-3 without root killing was hardy enough for all practical purposes.

The meeting then adjourned till 7 o'clock P. M.

EVENING SESSION.

THURSDAY, JAN. 20, 1887.

The meeting was called to order at 7 o'clock P. M. by President Elliot.

Mrs. Van Cleve, from the Committee on Floriculture, presented the following paper:

WILD FLOWERS.

By Mrs. Charlotte O. Van Cleve, Minneapolis.

When the whole earth is white and cold and the bare branches of the trees bend or break in the fierce wintry blasts it requires a somewhat lively imagination to write of blossoming things,

and a degree of faith to realize that in the fulness of time the beautiful things which one has are now "keeping house under ground," and the dry skeleton branches of trees and shrubs will again burst with greenness and beauty. But it is a salutary exercise of the imagination and a stimulant to the substance of things hoped for, the evidence of things not seen, and so we cheerfully take up our mid-winter talk of the flowers, the handi-craft of Him who "hath made everything beautiful in his time."

For many years I have been impressed with the conviction that we should take more notice than we do of the wild flowers so lavishly scattered over our prairies and woodlands, and that we might with great pleasure and profit domesticate them in our lawns and flowerbeds. They are hardy and, once planted, would come up year by year and amply reward our care with their rich, bright colors and graceful foliage. The variety is endless and doubtless cultivation, in some instances, at least would increase their beauty. Bring from the wild woods the Columbine, set it out on good soil and watch its growth, its pretty leaves and graceful stems. When the buds are partly open observe the fine little heads, cuddled closely together like birds in a nest, and see then the significance of its name, from Columbia, a pigeon or dove, and you will learn to love it as a thing of life.

For early spring what is more pure and perfect than the Blood root (*Sanguinaria Canadensis*)? Every part of it beautiful and the mystery about it from the fable which gave it the name of Devil's-bit increases our interest in it.

And while we would not cultivate the little thistle which farmers hate and all despise more or less, still it is a plant entitled to a degree of respect from its having a place with the Rose and Shamrock as the national emblem of Great Britain. The story of how it found its place there is as follows: When the Danes invaded Scotland it was deemed unwarlike to attack an enemy in the darkness of the night instead of a pitched battle by day; but on one occasion the invaders resolved to avail themselves of a stratagem and, in order to prevent their tramp being heard, marched barefooted. They had thus neared the Scottish camp unobserved when a Dane unluckily stepped upon a sharp thistle and uttered a cry of pain which instantly aroused the Scotch, who discovered the stealthy foe and defeated them with great slaughter. The thistle was immediately adopted as the emblem of Scotland. The earliest authentic record, however, of its appearance in Scottish history is 1458, when it is referred

to in an inventory of the property of James III., of Scotland, as one of the emblems on a child among the royal possessions.

The Partridge Berry (*Mitchella repens*) named by Linnæus in honor of Dr. John Mitchell, a learned botanist of Virginia, would be highly ornamental in a flower bed or hanging basket; and surely its near relative, the Trailing Arbutus, if it could possibly be tamed, would win the admiration of all.

The Pitcher plant grows in low, wet places, but in our well-watered State it would be no difficult matter to accommodate it. This is a beautiful and wonderful flower, called botanically *Saracenia Purpurea*, from Dr. Sarragena, of Quebec. It is known often as the Side-Saddle Plant. It is related to the *Darlingtonia*, a hooded Pitcher plant of the Sierra Nevada mountains, and the still more wonderful *Nepenthus* of the islands of the Indian ocean, whose leaves, with tendril-like prolongations, sometimes two feet or more in length, become at the ends perfectly developed pitchers. These plants are—some of them—insectivorous, and very interesting as a study.

The different varieties of the *Kalmia*, known as the Laurel, were named for Kalm, a friend and pupil of the great Linnæus, who was born in Finland in 1715, and after attending a course of lectures by Linnæus, devoted himself to the study of natural history. He was sent by the Royal Academy to explore the northern part of the American Continent, and made many valuable discoveries in the flora of that region. Although the plant was named for him, it is said that Banister, a Virginia botanist, had made Ray, the great English botanist, acquainted with it, and a living, growing plant was sent by Bartram to Collinson in England, as early as 1730. There are many interesting facts in the study of this beautiful flower. The very name of *Kalmia*, or Laurel, seems to bring before me the irregular shores of the Big Sandy among the Cumberland mountains in Kentucky, all glorious in the profusion of these wild, uncultivated beauties.

The Meadow Beauty, or *Rhexia Virginica*, is a very bright and ornamental flower, and grows freely in the Eastern states. The Beet Marigold (*Bidens Chrysanthemoides* of Michaux) is found in the Montana swamps, with its brilliant flowers, and is an interesting plant. Mr. Hulme, in writing of it, says: "The pansy and marigold are associated together as emblems of sorrow, and in some places wreaths of these flowers on cards, with such mottoes as 'May you ever escape them,' are presented to each other by friends as expressive of kindly feeling." The

rd for the marigold, "Souci," means also care and
d the flower is dedicated to the Mater Dolorosa. It
d barometer, closing its petals at approaching rain.
bing Hemp weed (*Mikamia Scandens*, named for
kane, of Prague,) is an exceedingly pretty vine, with
minute vari-colored flowers not unlike the heliotrope,
non everywhere in the United States east of the Mis-
t must be very easy of cultivation and very hardy.
te Bay *Gordonia Pubiscens* is a beauty, and if it were
obtain, it would bring a great price to the grower.
ern flower or shrub found in the everglades of Flor-
s named for Dr. Gordon, a botanist of Aberdeen,
belongs to the order of Camellias, and is first cousin
lant.

inal flower (*Lobelia Cardinalis*) is one of the most
wild flowers, and is common in New England and all
e eastern half of our country. It grows luxuriantly
ams and brooks. The poet sings thus of this forest

"The cardinal and the blood red spots
Its double in the stream,
As if some wounded eagle's breast,
Slow throbbing o'er the plain,
Had left its airy path impressed
In drops of scarlet rain."

c name was given in honor of L'Obel, a famous Flemish
the sixteenth century. Nor must we omit the elegant
d and Purple Aster which light up and glorify our
d wild woods in the autumn; nor yet the fringed Blue
e royal flower, namesake of a *king, all of which are
valuable, blooming long after many others have faded
to winter quarters.

he countless mercies and pleasant incidents which my
rs along my path of duty, I name a delightful day's
ars ago in the extreme northern part of Dakota, very
th parallel, in company with the Rev. Mr. Scott, of
l learned botanist and an enthusiastic lover of flowers.
the name and habits of every leaf and blossom, and
leisurely along through that strangely beautiful reg-
the Pembina Mountains, he stopped frequently to

king. *Gentian*, who is said to have first discovered the medicinal properties of
genus comprises several varieties.

gather some pretty thing which others might not have noticed and entertained me with its history, its origin, its uses, its time of blossoming, etc. I never so fully realized how lavishly the Creator has scattered beauty, even in unexpected places, all over the world. The old man rides from place to place, preaching of the love of Him who used the flowers of the field to illustrate the care of the All-father over His children and striving to lead his hearers "from nature up to nature's God," and although his life is a toilsome one and his way sometimes very rough, yet he finds a sweet solace and strength in this beautiful "silent teacher," with whom he holds intimate converse.

He showed me some beautiful things; a lovely little white bulb, whose name I do not now recall, almost equal in beauty to the lily of the valley, so precious to us all, and told me of many others not then in blossom, and of a variety of easily cultivated shrubs which would be highly ornamental in our public or private grounds.

That summer day's ride opened up to me a new and beautiful page in floral lore, and, though always very fond of flowers, I have ever since felt a deeper fondness for them, and have been persuaded in my own mind that it would add much to the gratification and real pleasure of those who love them to bring in these beauties, which "seem born to blush unseen and waste their sweetness on the desert air," and domesticate them, if practicable, for our continued enjoyment.

A vote of thanks was given Mrs. Van Cleve for her interesting and able paper.

President Elliot said the Society could appreciate the pains taken in the preparation of this paper, and Mrs. Van Cleve had called attention to matters of much interest to all. There are many wild flowers and things about our doors that appear common that are worthy objects for our consideration.

Mr. J. M. Smith said he had often been surprised that so little attention was paid to wild flowers, as many of them were more beautiful than some obtained at high prices. Under the microscope a common flower was an object of perfection scarcely to be found elsewhere in the world.

The following paper was then read; the headlines are inserted by the secretary:

RECOLLECTIONS OF FIFTY YEARS AMONG OUR
SMALL FRUITS.

By J. M. Smith, Green Bay, Wis.

Mr. President, Ladies and Gentlemen :

Sixty years ago I was a pale, busy, white-haired little boy, spending most of my time with my grandparents. My grandmother, a kind-hearted active old lady, had the entire charge of the garden. She was a dear lover of fruit of all the varieties grown in our climate. This love of fruit continued to her extreme old age. After she had completed her hundredth year, she would still go out and gather some of the choicest varieties and keep them in her room to distribute among her friends and relations. It was in her garden that I saw the first and only strawberry bed that I ever saw until I had grown to manhood. It was a little plot perhaps twelve feet square, of, as I now suppose, some of the Alpine varieties. They were white, and would with us be considered very small and very poor berries. The largest picking that I remember ever seeing was about one pint that my grandmother picked to give an extra treat to some friends who were visiting her. In short, strawberries at that early day were a luxury only to be enjoyed by the favored few, and by them only on extra occasions, and in small quantities.

SCARCITY OF STRAWBERRIES.

In the days of my childhood it never occurred to me, even in my wildest dreams, that I should live to see the day when strawberries would be as plenty and as free on my table as potatoes or bread and butter. If some good angel had appeared to me at that time and told me that I should at some time in the future be transported to Heaven in Elijah's fiery chariot, and another that I should some time have strawberries in the greatest abundance, not only for myself and friends, but thousands of bushels to sell, I should have believed one just as readily as the other; but if I had been called on to choose between them, I should certainly have taken the strawberry angel as my chosen friend.

My early home being only about twenty-five miles from New York City, I was often there when a boy, as nearly all the produce of my father's farm was carried there for sale. New York City was then the one and only one great market metropolis

of the United States, yet I have no recollection of ever seeing any cultivated strawberries, even there, until after 1840. Previous to that time the market was supplied (as far as it was supplied at all), with wild berries, many of them coming from the meadows about Hackensack, some five or six miles from the city. As to a supply, as we understand the word, there was no such thing known. Although I have no means of knowing positively, I have little doubt that there have been days within the past four years in which more berries have been received in Chicago in a single day, than were ever seen in New York City in its entire history previous to 1840.

EARLY EFFORTS.

In 1844 a friend of mine in Morristown purchased a few strawberries from New York, a great piece of extravagance as it then seemed to me, as wild ones were growing on many of the hills and meadows near the town. About 1847 or 1848 a friend of mine commenced growing strawberries for market which he sold in the town near by. The berries were hulled and then sold by the quart or peck, dry measure, as required. The price was usually twelve and one-half cents per quart, or one dollar per peck. About this time two new varieties made their appearance in the markets, viz.: Hovey's seedling and the Early Scarlet or as it was sometimes called, Jersey Scarlet. They were great improvements upon any varieties previously known, and soon after this berries in our Eastern markets became more plenty. Still, the season was a very short one, as shipping them from place to place, or from the South to the Northern markets, was quite out of the question. So three or four weeks was the extent of the season.

WILSONS IN WISCONSIN.

There was no one variety that was in general cultivation until Wilson's Albany Seedling made its appearance, I think some time between 1854 and 1858, the last named date being nearer than the former, though I have no means of obtaining the exact date. It became somewhat disseminated previous to 1861, and in 1862 it was often seen in the market. In 1863 it took almost entire possession of our markets, and for many years there were comparatively few of any other variety seen in any of our large fruit centres. This modest little plant created an entire new era in strawberry culture. It was the one variety that seemed adapted to every variety of soil and climate from the Atlantic to

the Rocky Mountains, and from Lake Superior to the Gulf of Mexico. In size it was equal, if not superior, to any of its predecessors, and in firmness and keeping qualities while being carried long distances, it was far ahead of any hitherto known variety. Its productiveness when upon rich soil and well cared for seemed almost to be marvelous. My own success, such as it has been, is in reality due more to my getting this variety at an early day, and then caring for it almost as a mother does her pet babe, than to any other one cause.

My first bed in Green Bay was set in 1859. It consisted of several varieties, such as were to be obtained, and we succeeded in growing one or two fair crops from them. I remember well our first attempt to sell the fruit. Our oldest son, then a boy of thirteen or fourteen, was sent to the city with a few of them nicely hulled and measured up in dry measure, and told to sell them for twelve and a half cents per quart, but the best he could get was an offer of ten cents for one quart, and he brought them home.

The following year I sold the first bushel to one man, delivering them to him as he wanted them, nicely hulled, for one barrel of flour. In 1862 we had our first Wilson berries, and in 1863 the first crop of them. In 1864 the size and yield was beyond anything I had ever supposed possible to obtain from any variety or by any known system of cultivation.

In 1875 I measured off an exact quarter of an acre of them, and picked the fruit by itself and kept a careful and accurate account of the different pickings. The result was 3,571 quarts, or at the rate of four hundred and forty-six and a half bushels per acre.

Last season, although one of almost unprecedented drought, having but two light showers upon the vines from the time they came into bloom until we were done picking, the average yield was a little over two hundred and fifty bushels per acre. About one-third of the ground, which was more light and sandy than the balance, was aided somewhat by artificial watering. With two or three more good showers, the crop would doubtless have overrun three hundred bushels per acre.

It is said that in many places this magnificent plant fails to do as well as in former years. I see no signs of failure on my grounds, and never had a finer showing for a large yield the coming season than when we put them into winter quarters last month. Still, with all of its fine qualities, it is not the perfect fruit that we all have been and are still looking for. Speaking

within bounds, I believe I have spent about \$1,000 in trying to get a more perfect fruit, but so far have been unable to find any variety that, all things considered, is its equal upon my grounds and with my system of cultivation.

Soon after the introduction of the Wilson, new varieties began to appear in greater numbers than before, and of every year since it may truly be said "still they come." The new varieties introduced within the last twenty-five years would, no doubt, run into thousands. If I should try to name them it would be about as interesting as reading a dictionary up side down.

Since it has been proved that with our present facilities for shipping, and with care in picking and handling, strawberries may be brought from the Gulf states and reach us in fair condition, the season for this delicious fruit is lengthened from three or four weeks to more than as many months, in fact from February until July.

CONTRASTS IN COMMERCE.

The quantity consumed now as compared with even thirty years ago, is almost past belief. I quote the words of President Earle in his address to the American Horticultural Society at Cleveland, Ohio, last September: "Thirty years ago the daily receipts of strawberries in Chicago, now the second greatest fruit market in the world, could all have been carried in one wagon, at one load, and it would not have been a large load either. Now, whole railway trains are engaged to carry the daily supply to that market, which often amounts to three hundred tons per day, and sometimes to twice that quantity. Thirty or forty years ago it would be safe to say that all the strawberries marketed in the United States in one day could have been gathered by a force no larger than I have seen bending over the smiling rows of a single plantation."

RASPBERRY RECOLLECTIONS.

But I must leave this branch of my subject and return for a moment to my grandmother's garden. In it there were, in addition to the little strawberry bed, two varieties of raspberries. One of them now known as the old Golden Cup, and the other a red variety which I presume was the Red Antwerp. The old red and white Dutch currants were in the greatest abundance, and

according to my recollection of them as good as the same varieties are to-day. Little fellows like myself were allowed to help themselves to both currants and raspberries from the bushes, but the strawberries, which we desired most of all, were to us the forbidden fruit, which we must not touch without enduring penalties that we imagined would be about as severe as those pronounced upon our first parents upon their violation of the first fruit command known in the history of our race. It will readily be seen that the improvement in currants and raspberries has been by no means comparable to that of strawberries. The Red Antwerp was for many years the standard raspberry in the Eastern markets, and they were supplied with it, as far as they were supplied with any variety. It was really an excellent berry in those portions of the East where it did its best, which were somewhat restricted even then, its favorite home being along the Hudson River, and I have never heard of its doing as well anywhere west of the Alleghany Mountains.

The improvement in raspberries has been confined principally to the last twenty-five years. Within that time many new varieties have been introduced, and some of them are of great value. Among the reds, I have found nothing that seems to me equal to the Cuthbert. It is a large and beautiful berry, of very fine flavor, an excellent bearer, and with me continues in bearing about five weeks. A year or two since I wrote to an old fruit grower inquiring how a certain other variety compared with the Cuthbert. He concluded his reply by saying, when I got a raspberry, all things considered, better than the Cuthbert, I would have something bordering on the marvelous.

I do not remember ever seeing any blackcap variety cultivated until after 1840, and very few of them were cultivated until within the last twenty years. Since that time many new varieties have been originated. Among the new ones I prefer the Gregg. It is a large, fine looking berry, a good bearer, and of fair quality, but does not continue in bearing as long as the Cuthbert.

I have no recollection of seeing blackberries cultivated before 1855 or later. I obtained a few Lawtons about 1860, but found them unsatisfactory and destroyed them. The Kittatiuny used to grow wild on my father's farm, and I presume they may still be found wild in that vicinity. Among the new varieties introduced within twenty years I doubt if there are any superior to the Ancient Briton. Many new varieties of currants have been

introduced, or at least many new names come out yearly, but the real improvement, so far as I can judge, has been much less than in any of the other small fruits upon our list. I am now testing some which may prove a success.

GRAPES IN THE GARDEN.

It is about fifty-five years since my father set the first grape-vines in his garden. They were the Isabella, which was then about the only variety grown in that section. The vines made a fine growth, and regularly each spring and early summer loaded themselves with fruit, and as regularly in autumn the fruit rotted and fell from the vines. Rarely was a nice bunch of grapes gathered from them during all the years they were cared for. The introduction of the Concord among grapes marks very much such an area in grape growing as the introduction of the Wilson in strawberry growing. The increase in the consumption of grapes has, as I believe, been greater than any other of the small fruits, strawberries excepted.

Last September I stood upon a hill a few miles outside the city of Cleveland, Ohio, and looked over what seemed to me an almost endless number of vines, most of which were loaded with choice fruit. I asked a gentleman who owned one of the near vineyards, how many acres of vines I could see from where I then stood? After thinking a moment he said, not less than 2,000 acres. Fifty years ago there were not probably half that number of grapevines cultivated in the entire United States. New varieties have been and are continually being introduced until their name is legion.

Fifty years ago we had cherries in the greatest abundance. The variety most common was a small black cherry, indifferent as to quality, but the trees sometimes grew to an enormous size and rarely failed to load themselves with fruit. In my native neighborhood were two that were not less than five feet in diameter at four feet from the ground, and I believe they sometimes bore not less than one hundred bushels of cherries in a single year. One of this variety still stands near my brother's home that is over three feet in diameter. There were other varieties of both black and red far superior to these in quality, in fact, it seems to me, none of the varieties now grown are superior to some of those grown on my father's farm fifty years ago.

A few words in regard to the larger fruits. Plums, peaches, apples and pears grew in the greatest abundance. I think the

plums began to be affected as early as 1835 with the black knot and other enemies, which in the course of a few years nearly destroyed the trees. Since that time, growing this excellent fruit has been accomplished in most places only by intelligent and persevering work in fighting its enemies, and then in many, if not the majority of cases, the perseverance of its enemies tires out the patience of the would-be grower, and the crop is given over as not worth the cost of so much time and labor.

My early recollections of peaches are, that we all had all we cared to use, and that the hogs had a good time with the balance of them. The average quality was not, of course, equal to those of to-day. The peach-growing district fifty years ago was almost entirely limited to small portions of the states of New Jersey, Delaware and Maryland, and even in these states, to be of any market value, they were restricted to within hauling distances of New York and Philadelphia, or within a near distance of the steamboat landings, as there were no railroads at that time running through the inland portions of these states.

PEACHES AND PLUMS.

One of the incidents connected with peach growing in those days may be worth relating. It is something over fifty years since that an enterprising Jerseyman concluded that it would be a nice thing to buy up the entire crop of the country, and in that way get control of the market, or in other words get up a corner on peaches. As the operation required more money than he had of his own, he persuaded his widowed mother, who had some property, his brothers and sisters, and some of his wife's relations to back him up in his brilliant scheme of compelling the people of the United States to eat high-priced peaches or to do without them. He commenced operations by purchasing and making small payments on, what he supposed was enough of the large growers' crops to give him the control of the market. Peaches did not go up worth a cent, but did on the contrary go down almost immediately to less than he had agreed to pay the growers for them in the orchard. The public generally probably never knew of any corner on peaches, but the originator of the scheme and his friends soon found themselves very effectually cornered. Judgments that buried them all in hopeless and irretrievable ruin was the result. It may be seen from this incident that the desire for making money at the expense of the public is not the exclusive growth of the last twenty-five years.

CHEAP CIDER.

Apples and pears were grown in the greatest abundance and with but little care. Sixty years ago apples were the main crop of the farmers of my native county, and in fact of that portion of the state. The large majority of the trees were seedlings. The apples were hauled to the mills and then ground and first made into cider, which was afterward distilled and converted into cider spirits. (I believe some of the wicked people of our day call it Jersey lightning.) The standard price of apples in those days was one barrel of cider for ten bushels of apples, or one quart of cider spirits per bushel, or six and one-half cents per bushel in money, payable after the spirits were made and sold. In seasons when the crop was extra large apples were sometimes as low as five cents per bushel. I have no recollection of any of even the Rhode Island Greenings or Newtown Pippins being carried to the New York market until 1840, although the distance was less than thirty miles. This may seem a very strange statement, but it must be remembered that the amount of fruit used per capita in those days was very small as compared with to-day. Another reason was that the masses of the people were far from being as able to purchase anything beyond the barest necessities of life as they are to-day. Wages were very low and money very scarce. But the days of the cider distilleries have nearly passed away. There is at present but a single one standing in a district of country where in my young days there were not less than fifteen or twenty, and I think more than that. There are not as many bushels of apples grown there as fifty years ago, but they are of a much better quality and put to a better use, bringing the owners much better compensation for growing them and caring for their trees.

PEDDLING PEARS.

There are pear trees now in bearing on the home farm which have rarely failed to yield their crop for one hundred years. In my boyhood every one used all they chose, and the hogs had a good time with the balance of them. The first sale of pears of which I have any recollection, unless an occasional peck or bushel to some one near home, was as follows. When I was a boy, perhaps thirteen or fourteen years old, my father loaded a wagon with pears, and told me and a brother two years younger to take them to Newark and peddle them out at private houses for the

best price we could get. Thus my brother and I started out on our first business trip outside of our native village. We had but fairly commenced trying to sell, when I saw the governor of the state in conversation with a few gentlemen; I knew him by sight, having seen him at my father's house though he did not recognize me; I stepped up to him and asked if he did not wish to buy some nice pears. It was during the great national contest between the Whigs and Democrats. The governor looked down upon me with a pleasant smile and replied, "Well, my boy, I don't know but I will take a bushel, provided you are a good Whig." I replied at once, "Of course I am a Whig, my father is a Whig, and my grandfather is a Whig; and we are all Henry Clay Whigs at that," which of course meant that we belonged to the most radical wing of the Whig party. The gentlemen present laughed and one of them said, "Well, governor I think the boy has got you." The governor took out one dollar and fifty cents, the price of two bushels, and directed me to take them to his house, at the same time telling me where he lived. Of course we used this as a lever to sell the balance of the load which we soon disposed of, and returned home in high glee and gave father about twenty dollars as the net result of our trip, and for some days after I was the hero of the neighborhood. No more pears for the hogs, or at least not for four-legged ones, they must be restricted for plainer diet, and pears be kept for governors and their constituents.

There were several varieties grown, some very good, and others worth very little. The Virgalien stood first in quality, and I doubt if in this respect it has ever been surpassed.

CONCLUDING COMMENTS.

Gentlemen, I have occupied more of your time than I intended and will bring these remarks to a close. It will readily be seen that the increase in the consumption of fruits, after allowing for the great increase of population, is very large; fifty years ago, as a rule, only those who grew fruit used it in large quantities, and their supply was mostly limited to apples, pears and peaches, and these not nearly equal in quality to those grown at the present time. We sometimes hear the "good old times" spoken of as preferable to the present, but for my own experience and observation, combined with the best information I have been able to obtain, I believe this is a much better country to live in than it

was fifty years ago. That we live better, are happier, and are as moral and religious as those who lived in the good "old times."

Then let us each use our influence to induce others to cultivate fruit of all kinds suitable to our soil and climate, and in such abundance, that the entire family may enjoy it, either fresh or canned, every day in the year. Such a supply would mean better health for old and young, less doctors' bills, less butchers' bills, and the good wives and mothers might soon banish from their tables and storerooms those everlasting and indigestible pies and cakes over which they now spend so many weary hours. Let them spend the time thus saved in interesting reading and pleasant recreation, and it would go far towards bringing back their faded beauty and their youth.

Farmers who have not tried this course, begin at once, and when you order choice fruit trees or plants, don't forget to order a few nice rose bushes and choice flower seeds for your wives and daughters. You will surely find the acre devoted to fruits and flowers, and well cared for, the best paying acre on your farm, and you will wonder how you ever managed to get along in any other way. Meet together in each others' homes, compare notes and profit by each others' experience, and you will in this way gather up sunshine to cheer you in some of the dark days of which we must all have our share.

The following report was then presented by Prof. Oestlund:

ENTOMOLOGIST'S REPORT.

By Prof. O. W. Oestlund, Minneapolis.

Having the honor of being elected your entomologist at the last annual meeting, it now becomes my duty to report on such work in this direction that may be of interest or value to you. Time and circumstances have not allowed any special observations to be undertaken during the year on insects injurious to fruit trees, and therefore of special interest to the horticulturist. My correspondence with members of this Society, as well as other fruit growers of the state, in reference to entomology, has not been very extensive either; but I would ascribe this in a great part to the fact that I am as yet almost a stranger to most of you, and that what is being done in this direction is as yet very little known to the people of this state. As this is

that should easily be remedied, it is hoped the same
ply for another year.

the year, two of the injurious insects, well known
Mississippi, have been discovered within the bound-
s state. Although both of these do not, in the first
rn the horticulturists, as they are insects injurious to
corn, yet the injury of at least one of them is of such
at I consider it as worthy of your attention.

of these is the Angaumois moth, so well known as in-
tored grain on the continent, in England, as well as in
e Eastern states of this country. My attention was
to it from this state by specimens forwarded to me by
Beales, of this city. Soon after I received the same

Porter for determination, sent in from some other
state that I have not yet succeeded to learn. This is
most destructive pests known to infest stored grain.
ict of Angaumois, in France, it appeared in such great
n the latter part of the last century that the whole
was threatened with famine, and the attention of the
t was drawn to it and commissioners appointed to in-
ne matter. It is undoubtedly an imported insect to
y, though it has been found here for more than a cen-
as shown itself quite as destructive here as on the

Mr. F. M. Webster, who has studied this insect in
otes an opinion from the New York *Sun* that if the
f this pest could at that time (a few years ago) be
the government at an expense of \$5,000,000, it would
investment ever made for the people. As the ravages
ct often will reduce the weight of grain from twenty-
y per cent, the estimation is probably not much
d.

ot only to call your attention to this insect, but to
familiar with it by presenting some of its life his-
by your investigating the specimens themselves,
ature of the injury done from specimens that I have
re for that purpose, that if you should find it in your
or in that of your neighbor, you shall know what the
and if we yet can not exclude this pest from our
, as he has now once entered, we can nevertheless do
heck a too rapid spread by not allowing him to breed

THE ANGAUMOIS MOTH.

The first communication on this insect in reference to its occurrence in America, was presented to the American Philosophical Society, of Philadelphia, in 1768. Soon after it was found in such great numbers in North Carolina as to extinguish a lighted candle when a granary was entered at night. It has since that time spread over a great part of the United States, and the state of Minnesota will now have to be added to this territory.

The insect is especially known to be destructive to wheat, and hence to be so much the more dreaded in Minnesota, though I am not aware that it has yet been found to attack the wheat here. It is also known to attack barley, oats and corn, the last of which is the nature of the injury as far as known in this state.

I will not here attempt to describe the insect in its different stages, as I think you can get a better idea by inspecting the specimens themselves, I shall only add a summary of the life history as given by Mr. Webster in the twelfth report of the state entomologist of Illinois.

SUMMARY OF THE LIFE HISTORY.

"The insect passes the winter in the larva state, pupates in the spring, and the moths appear in May or June. These pair immediately, and deposit their eggs on the young grains of the new crop in the field, if they are allowed to escape, or, if not, on the grain in the bins where they originated. These eggs hatch in from four to seven days, and the larvæ burrow into the grain and themselves transform to moths, about August, or often during the latter part of July. These moths pair and deposit their eggs after the manner of the previous brood, and the larvæ from these, nearly, if not quite all, reach maturity during the fall and transform the following spring. The number of broods and time of appearance vary greatly, with climate and season. In warm countries broods follow each other in rapid succession during the entire year."

REMEDIES.

There are several parasites known to attack this insect, notable among which is a mite that has been found very destructive to the larvæ. None of these parasites have yet been found in Minnesota, but we can expect in due time to find them also.

It is a known fact that parasites, or the natural enemies to an injurious insect, always travel a great deal slower than the insect itself, the cause of which is obvious to the student of entomology.

Of artificial remedies, as might be expected, a great many have been proposed and experimented upon. The only one that seems to be practical and efficient is by heating the grain. It has been ascertained by careful experiments, that grain can be submitted to a temperature of at least 140° Fah. without any injury to the same, while a much lower degree, kept up for a somewhat longer time, is just as effective against the pest, and is undoubtedly superior for the grain. One hundred and twenty degrees Fah., kept up for four hours, has been found fatal to the insect in all its stages. When but a smaller quantity is affected, as in case of seed corn, or samples of grain, the pest can also be destroyed by fumigating in some closed tank or vessel.

The other species, that at times has shown itself quite troublesome in some places, though never to such an extent as the foregoing, is the Spindle-worm moth (*Achatodes zeæ*, Harris.) The species was first described by Harris from the eastern states from whence it has spread to most of the states where corn is cultivated. My attention was first called to this insect from the state by specimens sent by Mr. S. K. Odell, of Vivian, Minn., with some of his own observations in regard to its habits. The mischief done by this worm consists of its boring into the stalk of the growing corn, causing the top to wither and become detached, so that it can be drawn out with the included spindle without any special effort. This worm, or larva, is, when full grown, about one inch in length, or often more, and is capable of completely destroying the stalk it enters. All the stages are passed through in one season, the moth coming out in August, when the eggs are deposited for the next season. Probably the best remedy against a too rapid increase or spread of this insect would be to cut the stalk of corn, as soon as it is seen to be affected by the withering of the leaves, and feed to hogs or cattle so as to destroy the worm before it is yet developed.

As my report contains very little that is of special interest to you as horticulturists, let me make a few general remarks on the subject of entomology in Minnesota.

ENTOMOLOGY IN MINNESOTA.

What has been done in the field of entomology for the State of Minnesota is very little, and can be summed up in a few words. As Minnesota has not yet had a state entomologist, nor any one that has systematically undertaken the study of insects, with the exception of Mr. Whitman's work on the locust, found in the annual reports of the survey, all that has so far been done is due mostly to the efforts of individuals, as found in the entomological reports of this society, and by writers in the several papers and periodicals. What other entomologists of this country have done that is of special reference to this state, is also very little. The work of entomology, so far undertaken by the geological and natural history survey of the state, can hardly be said to be more than begun in comparison with what remains to be done. During the short time that I have been in connection with the survey, it has been my privilege to use such spare time as I could find outside the routine office work in connection with the laboratories of the survey and the care of the general museum, to the study of entomology. Making the best possible use of this time, I have so far collected something more than 2,000 species from Hennepin and Ramsey counties, to which locality it has been necessary to restrict my work. These are now in the possession of the survey, but to the greater part as unworked material from the lack of time and literature for their proper identification. What scientific work has so far been accomplished is almost exclusively confined to one family — the *Aphididae*, or plant-lice. A preliminary report on this work is found in the fourteenth annual report of the survey, and a more extensive report on the same, being a synopsis of the one hundred species now known from this locality, is to the greater part in manuscript, ready for the next annual report.

Competent entomologists now generally believe that the number of insects for the whole world will not fall short of one millionspecies, of which already more than seven hundred thousand are in the different collections of the world. Taking this as a basis for the estimation of the number of insects for this state, I cannot put the whole number at less than 20,000, or ten times the number that have already been collected. The work that therefore remains to be done is much, and can probably not be correctly estimated by the professional entomologist himself.

The law creating the geological and natural history survey of

Minnesota, drawn, as it is, on a broad basis, makes provision for the study of entomology. Section 3 of this law states that the natural history survey shall include: first, an examination of the vegetable productions of the state, embracing all trees, shrubs, herbs and grasses, native or naturalized in the state; second, a complete and scientific account of the animal kingdom as properly represented in the state, including all mammalia, fishes, reptiles, birds and insects. But as this law also calls first for the geological survey proper, it is obvious that most of the efforts at present are concentrated on this work so as to bring it to an end; and the work of natural history can only receive secondary attention. Moreover, a complete and scientific account of the animal kingdom, including the insects, is an undertaking that will require a great deal of time. The result of such work is the best and fullest that can be got, and this state is to be congratulated for having made provision for the undertaking of such a work.

But the farmer, horticulturist, and many other industries to which insects are found to be destructive, can not afford to wait for such results. What they mostly want is the study of special cases as they present themselves from time to time. In a state that is being so rapidly developed as Minnesota, great changes must annually be brought about in that large tracts of land are put under cultivation, others drained, or the timber taken off. Such changes we know tend to destroy the balance of nature, and bring about abnormal conditions, that makes it possible for a species of insect, that before, probably, was hardly known, all of a sudden to increase in such great numbers as to become destructive, as is well known in the case of the Colorado potato-beetle and many others of our injurious insects indigenous to this country. Every year also brings new insects here from other parts of the country, that often prove quite as destructive. What you therefore want is not so much the collecting and naming of insects from the state, as an investigation of such abnormal cases, with special study of the life-histories and habits of such insects that are found to be injurious, not only to the horticulturists and agriculturists, but also to the forester, stock breeder, and many other industries to which the destruction by insects is more or less extensive; such observation to be published for immediate distribution to all it may concern.

Much valuable service could also be rendered by determination of insects sent in from all part of the state, and by giving

full answers to all inquiries in regard to them, recommending such remedies or treatment that are known to be most effective. By the formation of biological collections of all insects found to be injurious to some crop or industry, much would also be done to disseminate a correct knowledge of insects among the people; such collections to be placed for convenient study or inspection to all it may concern, by being exhibited at the meetings of the different societies, or at the annual fairs. To give you an idea of what I mean by such biological collections, let me call your attention to the two cases of insects that were hastily put together from such material as was at hand, in order to illustrate this point. The one containing insects injurious to the cabbage, illustrating a paper on this subject in the thirteenth annual report of the survey; and the other containing some of the insects found to be injurious to the apple tree. As I have not yet had opportunity to study the insects injurious to the apple, I have most of these only in the imago state, though a properly arranged collection of this kind would contain each species in all its stages, from the egg, larva, or worm-stage, during which most of the injury is usually done, the pupa or chrysalis state, to the imago, or fully developed insect. Such a collection properly named, and if reference to published articles on species be added, would give a great deal of information in the shortest time possible, and be profitable to every intelligent observer.

Although it is the aim of the survey, in as far as it is able to undertake the work of entomology at present, to reach the best and most practical results that are consistent with good scientific work, yet I think the immediate wants are such, not only for you as horticulturists, but for many others, as would call for the appointment of a state entomologist with the necessary appropriations to enable him to devote his whole time to this work.

DOES IT PAY TO HAVE A STATE ENTOMOLOGIST?

From the conduct of such states that have already undertaken this work, we would say that it does pay. Illinois has for the past fifteen years had her state entomologist, and twice on the death and once on his removing from the state, has his successor been immediately appointed. New York, the Empire State, had her state entomologist in the life-long work of Dr. Fitch,

and when he from impaired health was not longer able to discharge the duties of the position, the office was abolished, only to be in a short time again resumed, and is now ably filled by Prof. J. A. Lintner. Many other states have undertaken this work, which show the most gratifying results. It is from this that we have the noble life work of such men as Harris, Fitch, Walsh, Glover, and many others that are still at work, to show up for the study of entomology in this country.

Besides there are some special reasons why Minnesota should have a state entomologist. Situated, as we are, on the boundary to the North, we are still, in several respects, the central state. Here the three largest and most important zoological provinces of this country find a common center. To the north we have a portion of the Canadian province, with the many insects that are destructive to the pine and other coniferous trees. And as more than one-half of the state is covered with the valuable pine, making its lumber interest one of the largest, this alone should justify the appointment of a state entomologist. To the west the central province passes our boundaries, and many of the injurious insects peculiar to the great plains of the west threaten the destruction of our crops, especially the cereals. Under this class I would mention the Colorado potato-beetle and the locust; the ravages of which I doubt not all of you have more or less experienced. The south eastern half of the state is contained in the great eastern province, where most of the well known insects east of the Mississippi, both injurious and others, are to be found. And most of those that are imported from other parts of the world, will at least invade this part of the state after a few years of steady march across the country. Here we find most of those insects that are destructive to the horticulturist as well as the agriculturist. We have, therefore, to become familiar with, and to fight not only the host of insects known east of the Mississippi, but to the north we have many of those peculiar to the northern parts of this continent, and to the west we are threatened with incursions from many of the destructive species found on the great plains of the west.

But although it can be said that we are beset with enemies from three sides, all of which are formidable and must be fought separately, I do not think it will warrant us to draw the conclusion that Minnesota is subjected to greater loss from depredation by insects than any other state or country. The fact need not therefore be discouraging to any one of the many industries

that are flourishing here. But it will make the study of entomology a more difficult and complicated undertaking, than probably for any other state of the Union. As a compensation to this we have for the entomologist a richer field, together with the opportunity to solve many questions of the highest scientific interest, here at the commingling of the three greatest zoological provinces of North America.

In conclusion, gentlemen, let me thank you for all the aid and courtesy that has been shown me in this work, the study of entomology. In return I wish you all success in the noble work that you have undertaken, the most gratifying results of which are already apparent, not only to many of our own people, but it can well be said, to the people of the United States, as I think all will concede that had the opportunity to see some of your results at the New Orleans Exposition. To your Society also belongs the honor of first advocating the need of undertaking the study of the injurious insects of the state, and I hope that your endeavors in this respect shall be crowned with full success by the appointment of a state entomologist. In the meantime it shall be my endeavor, as time and circumstances will allow, to work out some of the insect problems that may be of interest to you. I hope, therefore, in the future, not only to keep your good will, but to have your active co-operation in this work. You are the ones that are first likely to discover the enemy, be he an invader from the East, the North, or the West, or be he one that for years has hovered around your premises, and now thinks he has found a weak spot and therefore makes a desperate effort to take possession of what belongs to you. In cases like this, if you would catch some of the enemies, forward them to me at the state university for investigation, it shall be my delight to examine the annals of warfare against such a species, and in return give you such information and advice that might be of some value to you. The appearance of such an insect in your locality would also be put on record, and be of much value to the work of entomology on the survey, and hence be of mutual benefit to both of us. Moreover, all such insects properly named and exhibited at your meetings would illustrate the report of the entomologist, and make the discussion of insects much more intelligible and profitable to all.

DISCUSSION.

Mr. J. M. Smith. I would like to ask the professor about an insect that has been destructive in Wisconsin. He spoke about insects destructive to cabbage. I noticed this last season an insect the size of a small fly, in the neighborhood of half an inch in length, as large around as a small darning needle, that attacked the cabbage, laying its eggs on the leaves of the plant. They came in countless numbers in the dry weather and destroyed the plants by the thousands.

Prof. Oestlund. What was the nature of the injury?

Mr. Smith. They ate into the leaves and destroyed them so the plant would not head at all.

Prof. Oestlund. With reference to insects injurious to cabbage, I would say that I studied those two years ago on the experimental farm. I found there nine species that were injurious, four of which were worms, and all of them quite injurious.

Mr. Smith. The insect referred to when on the plant is green.

Prof. Oestlund. From the description given it might perhaps be the cabbage *Plutella*. I have a sample of those here among my collection of insects.

The meeting then adjourned till 9:30 o'clock, Friday morning.

MORNING SESSION.

FOURTH DAY, FRIDAY, JAN. 21, 1887.

The meeting was called to order at the usual hour, President Elliot in the chair.

Mr. B. S. Hoxie, Corresponding Secretary of the Wisconsin Horticultural Society, was here introduced and on motion of Mr. Sias made an honorary member of the Society for five years.

REPORTS FROM EXPERIMENTAL STATIONS.

THE STATE UNIVERSITY FARM. REPORT OF PROF. EDWARD D. PORTER, SUPERINTENDENT, ST. ANTHONY PARK.

Mr. President and Gentlemen :

I suppose the establishment of these different experimental fruit stations is for the purpose of getting as wide a distribution of trees, plants, vines and shrubs as possible, in order that their

merits may be tested thoroughly, so that the effects of climate, soil, etc., may be observed in all these different localities. In order to be of value this work needs to be continuous, and in order that the information may be of greatest advantage there needs to be a report presented from year to year as to actual experience and observation during the year. Then, when these are collected, a person by looking back at the reports, extending over a series of years, will be enabled to form an estimate as to the progress made.

I would state that I have not prepared a written report to present at this meeting, but I have made a report to the board of regents which is now in press and of which I have here proof sheets of such portions as relate to this experimental work. I shall not take up your time by reading this report at length but wish only to glance briefly at the different lines of work. Copies of the work, which will contain over five hundred pages, will be mailed to members of the Society.

THE EXPERIMENT STATION.

An agricultural experiment station is an institution provided with a suitable equipment of lands, houses, stables, plant houses, apparatus for testing seeds, laboratories for chemical investigations, farm stock, implements and machinery, and provided with a working force of intelligent, enthusiastic, scientific and practical men, well trained in the several departments of agriculture, horticulture, stock and dairy management, forestry, chemistry, botany, entomology, and veterinary science.

The object of such an institution should be to conduct original researches or verify experiments on the physiology of plants and animals, the diseases to which they are subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of different systems of rotation of crops; the adaptation of trees, plants and shrubs to the conditions of soil and climate of the locality of the station; the analyses of soils and water; the influence of drainage and irrigation; the chemical composition of manures, natural and artificial, and their adaptation to different crops.

RUSSIAN APPLES.

Undoubtedly the greatest horticultural need of Minnesota is a good list of hardy apple trees. Experiments with a view to fill-

ing this want have been conducted by private citizens and many creditable seedlings obtained — notably Gideon's Wealthy. But there is yet to be found a single late-keeping winter apple of even medium quality among the whole list of seedlings which will endure our severe test winters.

It was deemed best for this experimental department to take up the Russian apples and endeavor to determine their hardiness, season, quality and adaptability to our climate. It had been known for many years that the climate and soil of Central Russia corresponded in many particulars to that of the great central basin of America.

Prof. Budd, since his visit to Russia, has made large importations of what he regards as their best sorts for American planting. Other importations of greater or less value have also been made, so that there are probably over five hundred varieties of Russian apples in this country to-day. The great majority of these will not prove equal to our need; many come from the coast sections of Russia; others, again, have grown where cooler summers were the rule, and thus their fruit is found to ripen too early here. It is not probable that all will be found adapted to the requirements of this State, but if only one out of all the immense list we have is found to possess the necessary qualities, the expense and labor will have been amply repaid.

In the spring of 1885 we received from Prof. Budd cions of Russian apples. Discarding all injured varieties, a list was secured comprising 179 varieties of apple grafts.

These were root grafted at Ames between the twentieth of March and first of April. They were packed in sand two weeks, then repacked in sawdust and shipped to Minneapolis, and considering their rough usage a very good stand was secured.

In addition to these root grafts, fifty-six varieties of two-year-old trees were obtained of Prof. Budd at the same time. The experimental orchard stands on an almost level piece of prairie, with a low wet spot in the centre — exposed on all sides to the winds.

Of fifty-two Duchess apple trees — three years old, planted at the same time in the same orchard as the above, but five died, — or not quite ten per cent., — which would indicate that not more than one in three of the Russians is as hardy as Duchess. The past winter shows the following result: Total number of trees set, 114; total varieties, 57; per cent of trees dead, 32½.

In this list those trees which up to the present time (Decem-

ber 1st), have made the best growth and seem best suited to the situation are as follows:

177	Green Streaked,	457	Klineff's Apple,
	Borovinka,	361	Pointed Pipka,
	Grucherka,		Yellow Transparent,
	Antonovka,	200	Rosy Little Turnip,
	Rulut's Nalin,	496	Babuschino — Grandmother's
	Aport Orient,		Arkad,
934		22 M.	Blushed Calville.

In the spring of 1886, thirty-four additional varieties were sent and the orchard now contains eighty-one varieties of apples.

THE HILLSIDE ORCHARD.

This orchard, planted on a northwest slope, is protected on the south and west by a natural grove of oak; the ground was cleared three years ago and planted to rutabagas. The trees were set in the spring of 1885. The list comprises apples, crabs and plums. The apples and crabs have all grown well — Duchess and Wealthy being very good.

The list of Russian apples growing on the farm has been already published in the report of last year. There are certain varieties that have proven worthless and which should be rejected as such. Varieties that fail in one locality may, however, succeed elsewhere. It is going to be impossible for any one station to do this experimental work satisfactorily. We have not only a large area of country, but wide diversity of soil and climate in Minnesota. The conditions in the southern portion of the State are entirely different from those we have here. Instead of having two fruit stations under state control, we should have at least four, with dozens of other experimental sub-stations. Varieties that prove to be valuable under these varying conditions could then be generally recommended.

We have given considerable attention to Russian apples, have secured a few Russian pears, a collection of Russian shrubs and ornamental trees. Some of the Russian importations promise to be very valuable additions; two or three of the willows are specially promising. The same may be said of some of the ornamental shrubbery.

THE VINEYARD.

The vineyard was planted three years ago. It is purely an experimental collection of those varieties which would seem to be

best adapted to growth and maturity in Minnesota. The collection consists of twenty-two varieties. A small crop was grown last year, but the present season brought an abundant one, and afforded an excellent opportunity for judging the relative merits of the different kinds.

The vines stand eight feet apart both ways and are trained to trellises running north and south. During the first half of the growing season very thorough cultivation is given with cultivator and hoe, and at no time are weeds or grass permitted to grow. There is nothing on a fruit farm that demands and so well repays good care as a vineyard. Thus far we have practiced the long cane renewal system of pruning with very gratifying results.

Concord.—This variety has been justly called the "Grape for the million." It is hardy, having thick leaves that insure healthiness during the hottest summer, and is one of the most productive sorts known.

Niagara.—This is a new white grape, for which great things are claimed. Our vines, set in the spring of 1885, have made excellent growth, and are perfectly healthy. The vine resembles the Concord, of which variety it is a seedling. It is not quite so strong a grower as its parent and the leaf, though good, is not as thick as Concord.

Janesville.—The vine is very hardy, a rather slender but vigorous grower, with thick, healthy foliage. The clusters are quite small, very compact, sometimes shouldered; berries medium or small, black with some bloom. In flavor, as in size, it is much inferior to Concord, having a decided foxiness.

Pocklington.—This is a seedling of the Concord. A moderate bearer; berries large, of a yellowish white color, borne in medium to large shouldered bunches. The skin is tough and the pulp too solid; it wholly lacks that melting quality that is so noticeable in the Lady.

Delaware.—The Delaware is one of the best grapes of our collection. It is not a strong grower. The clusters are small, compact and shouldered. The berry is small, of a dark red color, covered with delicate bloom. Skin thin and tough, pulp very sweet and melting.

Martha.—The Martha has proven the most productive of all the "white" grapes in our list. The berries are medium in size, having a very thin, tough skin. In season it is five days later than the Concord, and may therefore be considered as on

the verge of, if not beyond, its latitude. The vine is a good grower, with dark green healthy foliage.

Lady.—The Lady is the best of the white grapes, though with us not so productive as the Martha. The berry is almost as large as the best Concords, and when ripe is very light yellowish green in color. The bunches are rather loose, of medium size. It is a very sweet, melting grape, and as it ripens a little earlier than Concord, may be safely planted in this section. It is not a good bearer, and would not prove profitable for a market grape for that reason.

Moore's Early.—This is a black grape, that is deservedly popular where known. It is, perhaps, the earliest grape in our vineyard. It is a vigorous grower, giving heavy canes with large thick leaves, which drop long before all others in the fall. In quality, Moore's Early surpasses the Concord, and is the best black grape in our vineyard. All things considered, we regard it as the best grape for general planting in this State.

Ives' Seedling.—In this variety we find little to recommend. The berries are medium in size, black, with no bloom, rather sour, with a strong, foxy flavor.

Worden.—This is, after Moore's Early, the most promising of the newer black grapes. In habit of growth it closely resembles Concord, of which variety it is a seedling. Our vines bore well the past season, and we can safely recommend it for planting in this State. It is to be preferred to Concord on account of its earlier maturity.

Brighton.—It bore a fine crop; berries of medium to large size, dark red, with delicate bloom. The skin is thin, the pulp very melting and sweet, with a delicious vinous, slightly spicy flavor.

I advise the planting of the following varieties:

For the extreme north, Janesville and Moore's Early. For the State at large, for general market and home use, Moore's Early, Worden, Delaware, Brighton, Concord.

I have about 2,000 Russian two-year-old grafts that I wish to distribute this spring, and have received authority to make a distribution from our younger orchard and nursery ground, according to my own wishes. My plan was to take up two or three specimens and distribute to horticultural stations throughout the State; in the next place to gather and send a collection to county horticultural societies; in the third place to find the most intelligent cultivators and send a collection to them. Can you suggest any better way? I thought I would not send out yearlings, or

which we have about 5,000. I should be glad to make up bundles of willows and poplars to send out where I can do so. These trees have been covered with snow and are in better condition than if cared for in any other way.

Mr. Pearce. We think trees kill before the snow comes.

Prof. Porter. I know these are not killed.

Mr. J. M. Smith. You are going to have the killing down at home?

Prof. Porter. Yes; I got our stock in Northern Iowa; we used long stock for grafting; we took no short pieces. I have not been in the nursery business much myself, but have lived next door to two of the largest nurseries in the country and know it is impossible for any one man to do everything; he has to delegate his work to assistants, such men as can be had at \$25 a month, men who are careless and who will disobey most positive instructions. It is not to be wondered at that varieties are not always true to name. I have bought grapevines from one of the best growers in the country and found six kinds in the lot not true to name; I suspected it soon as the foliage came out; I *knew* it as soon as the fruit appeared.

Mr. J. M. Smith. You did not get any wild grapes, I suppose?

Prof. Porter. Yes, sir, I did. I got two wild grapes among the number. Some of the gentlemen present are among the number who have been humbugging me and haven't sent me varieties true to name. I don't wish to apologize for May & Co. at all. I think the burden of proof is very strong against them as it has been brought in here. But I say that there are nurserymen here that have sent me false stock and they are in this room. [Laughter.]

President Elliot. They haven't any paint on the nose!

Prof. Porter. I paid full price for the stock and yet found there were mistakes made. So we must exercise a little charity and do unto others as we would have others do to us. If we find a man persistently dishonest and refusing to make the proper amends when his attention is called, then brand him with as black letters as you can put on. I have had all sorts of complaints sent me about our nurserymen and I have sent these to the parties, and without explanation they have made the correction; where they had improper agents they have been ferreted out. If a principal will not do that, after a dishonest agent is reported, then I say go for the principal.

FOREST TREES.

In regard to forest trees I would say that I have been trying Catalpa and Black Walnut, and thus far they are doing splendidly. The former has made a very fine growth. We have a good many ornamental trees and shrubs.

RUSSIAN WILLOWS.

Salix fragilis—*Red Willow*.—This variety is said to take the place of pine in many parts of Russia, the wood being light, strong and easily worked. It is a rapid grower, and is propagated easily from cuttings. The twigs are quite red in winter, whence the name.

Salix Napoleonis is a drooping form of peculiar beauty. The leaves are small, linear, with a bluish green color. The branches are very slender. It has not yet been grafted, but when a good stock is found we will have no "weeping" tree superior to it. Perfectly hardy and easily grown from cuttings.

SMALL FRUITS.

STRAWBERRIES.

The past season proved very trying for strawberries, and resulted in an almost complete failure of the raspberry crop. We had no rain from the time the plants began blooming until near the end of the strawberry season. The result of this was a fair opening of the season, with fine large berries. A few very warm days ripened much of the fruit prematurely, so that, with a glutted market and later on very small, immature berries, the crop was far less profitable than the first days of the season promised.

In order to test the relative merits of matted row and single planting, two beds had been set in the spring of 1885. The "matted row" bed contained the following varieties, so planted as to secure ample fertilization for the sterile sorts: Crescent, Countess, Manchester, Chas. Downing, Windsor Chief, Captain Jack, Ironclad, Minnetonka Chief, Ray's Prolific, Wilson, Glendale, Jas. Vick, Green Prolific, Jersey Queen. Of the last three varieties only a few plants were set. From one and a half to four rows, three hundred feet long, were planted with each of the other sorts.

When the plants fruited last spring it was found that certain sorts were badly mixed;—Countess and Crescent occupied the same row; Glendales proved in the main to be Crescents,—the other sorts being in the main true to name. Dealers and buyers can not be too careful in regard to this matter of keeping varieties distinct and true to name. As soon as the mixture was discovered labels were placed defining exactly its extent, and any further mistake thus prevented.

The following notes may be of value to new planters:

Crescent.—This is the most popular variety grown in the State. It succeeds well in a great diversity of soils, bears large annual crops, has a bright red color, and when fully ripe a pleasant flavor, though not so sweet as some others. It is sterile in flower, and must therefore always be planted with fertile sorts—that is, with varieties whose flowers have both stamens and pistils. The best method is to plant every alternate row with the fertile kind, although it is not uncommon to secure good crops when only the fourth rows are thus set. It is one of the earliest varieties, and this, with heavy cropping, has made it the most valuable market sort grown.

Countess, or Downer's Prolific.—This berry is lighter colored than Crescent, and hence does not sell so readily. It is round, very tender, and when fully ripe has a fine, delicate flavor. It did not bear well for us, requiring a heavier soil.

The Manchester is one of the largest sized berries grown. It produced the largest berries of any we have. In color it is very light—a coral red. It is flattish conical, oblate, and is not as good as Crescent, and a medium cropper.

Chas. Downing is one of the older sorts, justly celebrated for its sweet, delicate flavor. It is a dark red, rather long, conical berry. It bore a very light crop this year, and the fruit, which is only average in size at best, was very small. Later in the season the leaves were slightly troubled with rust.

Windsor Chief is a flattish, oblate berry, of very dark red color throughout. It is very rich, and in good seasons doubtless a good bearer, as much of the fruit was set which, owing to the dry weather, was very small and “knotty.” The plant grows very close to the ground, and should be carefully mulched to keep the fruit from being soiled.

Capt. Jack was almost a failure this year. But little fruit set, and it was very small and crude. The plants are not healthy on our light wood loam.

Ironclad.—This variety has the best foliage of any in our list. It blossomed sooner than any of the others, but owing to the drought very little fruit was set, and it was of poor quality. It is doubtless a good variety.

Minnetonka Chief.—This variety gave great satisfaction. The bulk of the crop was gone when it began fruiting. It gives a large number of medium, even-sized berries—quite acid, when fully ripe, and its high flavor surpasses the Crescent. It grows well, has good foliage, and is a very good late variety.

Ray's Prolific.—This berry is prolific only of plants—its fruit is too small and too scarce to be of any value. Not worth the ground it occupies, but we shall test it again next season.

Wilson.—This old-time favorite remains one of the best berries in the list. A row of Wilson and Crescent—about an equal mixture—gave a remarkable yield. Its firmness and its bright color make it one of the best shipping berries grown. It is early and is thus one of the leading sorts for the home market.

Glendale.—Our plants of Glendale nearly all proved to be something else. The few plants that were true to name gave large, firm fruit, of a rather dull red color. In size it is very good, and when fully ripe has an agreeable flavor, but it seems from this year's test, scarcely equal to our other late sort—Minnetonka Chief.

James Vick, Green Prolific, and Jersey Queen.—Our plants of these varieties were too few to give a fair idea of their worth. None of them are as good growers on light loam as Crescent.

HILL CULTURE.

In the spring of 1885 a large bed was set from which the runners were carefully trimmed. Crescent, with every third row Wilson, was planted. The growth was very fine. The plants were set fifteen inches apart in the rows. In autumn they had filled the intervening space—all runners having been cut off.

The bed was given a light mulch of cornstalks in December. The snow drifted badly over it and in March a few weeks of freezing and thawing made ice cakes here and there over the patch. The result was that wherever the ice had thus formed the plants were killed. A very poor crop was obtained. During the past season the dead plants were reset with all fertile sorts and the bed changed to matted row system.

RASPBERRIES.

The following raspberries were set in the tree rows of the hill-side orchard in the spring of 1885: Red: Superb, Cuthbert, Turner; Black: Gregg, Doolittle; Yellow: Golden Cup.

To these were added in the spring of the present year: Brandywine, Marlboro, Tyler, Mammoth Custer.

Neither the Superb nor Turner, which resemble each other in their habit of growth, produces such strong canes as Cuthbert. Both are good healthy varieties and have made an excellent showing this season. Only a few plants of Gregg lived, they being in very bad condition when received. Those few, however, were covered with fine, large berries of good quality.

BLACKBERRIES.

Owing to the very bad condition of our first setting when received very few lived. Those few, however, made excellent growth; they were covered with earth last winter, came out this spring in excellent condition and should give a fine crop another year. The variety is Snyder. Last spring we planted Ancient Briton and Stone's Hardy, both of which have grown very well during the summer. There is scarcely any doubt but that all these varieties, with proper protection, will be successful here.

CURRANTS.

We have fruited this year Red and White Dutch and Black Naples currants. Red Dutch, one of the oldest varieties known, remains one of the best for general culture. It is a great bearer and stands the neglect, to which the currant bushes are usually doomed, better than any other sort. We have added this year Stewart's Seedling and Fay's Prolific, both of which have done well, Stewart's being the more rapid grower.

CONCLUSION.

In this experimental station we have just got barely ready for work. The state passed a law two years ago requiring the board of regents to establish a state experimental station. But as yet no appropriation has been made to meet the expenses of this experimental work and we have done the best we could with the means at our command. This meeting should pass a resolution

asking the legislature to take action looking to the support and equipment of our experiment station; the results would inure greatly to the benefit of the people of the state. In view of the importance of this matter I submit to you if it is not proper that this work should be urged to its fullest degree of development. We will give us \$5,000 and we will show better results. We want intelligent laborers; we have to label everything carefully but we don't want to put a "bell on a burbank;" they should know these different varieties at sight, and be able to pick out a Weahty from five hundred other varieties. Great care is required in making these experiments in order to be of value. It is not expected that it will be profitable work except in the results in general.

Mr. J. M. Smith. In regard to the Black Walnut my impression is they will be found to grow well for a few years and then to fail; this has been the experience of some friends of mine. Their native habitat is further south where the winters are warmer.

Prof. Porter. I am a little doubtful of success with them, but we propose in a small way to continue to experiment.

Mr. Sias. I have found a black walnut tree in this State that was about four feet in diameter, and there were many of smaller size.

Mr. C. L. Smith. There are many of them growing in Richland County. But I have tried to raise trees from Illinois seed and failed.

Mr. Hoxie. They grow well in Brown County, Wisconsin, and I have seen them planted by the roadside.

Mr. Gould. Black Walnut does well in some sections of the State. It grows very readily in Le Sueur County. A party at Waterville gathered twenty-five bushels of nuts one season.

President Elliot said he had had experience with the Black Walnut; it was necessary to use Northern seed to propagate from. There used to be a good deal of the timber in our native forests.

The following interesting paper was contributed by Mr. Ludloff in lieu of a report on fruit growing:

THE USE OF FORESTS.

By Chas. Luedloff, Carver.

Forests are the most beautiful ornaments of a country. Their use for mankind and their signification in the econ-
ture need to be proposed, still they remain the most
pictures in the country; the most magnificent construc-
e vegetable world, the graceful halls in which one will-
es. The living monuments of the fathers, the stately
have another purpose than merely to become a source

The hearts of the travelers and invalids rejoice as
g the threshold of the forest, and the multitude would
brate their festivals under the canopy of the worthy
man in moist halls or under tents. It will be entirely
show how the forest has both a direct and an indirect
uch as very many people are still under the influence
ition of the claim period, and feel themselves justified
ing the forest although the circumstances have very
nged. The nearer the people are to those primitive
nces, the more inconsiderately is the forest made use
y, indeed, in an improper, but also in a proper man-
latter takes place where the frequently misunderstood
edom and the misunderstanding of the peculiarities of
have united to enable the possessors of the forest to
it as they please — a mistake against which the Swiss
ded themselves. There the owners of the forest, when
use of it, are obliged to reflect upon the effect that its
n will have upon the country.

Direct use of the forest is the compacting of the soil.
of the trees become united with the surface soil, which
he washing away of the fine soil. Whenever this is
is washed away into the valleys. Gutters are formed
ome deeper and wider from time to time, so that finally
are rocks are to be seen. The earth and gravel that
washed away remains in the valley and renders it un-
e (*vide* California), or they are carried still further and
ds of streams. They cause inundations, and in order
may be averted a great expense for dams and for their
ntailed. The forest serves to compact a loose, sandy
ake it useful, which would otherwise be unproductive.
ns of cultivated land contiguous to forests are pro-

tected from dry winds on the lowland and from avalanches on the upland.

Experience has shown that denuded countries suffer more from storms than do those where the forests have remained standing and that farm and garden crops become uncertain. As soon as the plateau became covered with trees, the ground could be profitably cultivated. Normandy, in France, is an example of this.

The forest, also, has a positive effect on the climate and on the heat. It serves to prevent extremes. With regard to its effect on hail storms nothing definite has been ascertained. It was observed in France at a certain time that a hail storm raged with great fury until it reached a pine forest, when the hail stones ceased to fall, but began falling again when a section of country was reached where there was no forest. An ordinary forest has not as much power in this respect as a pine forest.

The influence of the forest in the moisture of the air, on the amount of rain-fall and on the dew is of untold significance. Exact examination has shown that the atmosphere in and near a forest is more moist than elsewhere. How dew, mist and rain are formed can be seen in the forest on a damp summer's day. Here and there small clouds of mist become visible, which grow larger and larger and cover more and more of the forest streams. Along on the plateau this occurs much later or not at all. The most important use of the forest consists in the regulation of the water courses above and under the surface, especially in the mountains and high land, but also in the low land. The springs and streams depend upon the forest. This was demonstrated on my farm. As I was walking along the edge of the forest I unexpectedly stepped into a spring which was hidden by grass. Years afterwards a house was built near this place and from this spring the water was to be obtained. But there was no water to be found owing to the cutting down of the trees.

The water supply is kept up by the water forcing its way along the roots of the dead and living trees. With regard to the quantity of water in a country of forests and in one where there are none, I have noticed this statement somewhere: If there is a quantity of water beneath the soil covered with litter and the water be represented by 100, then there will flow into the strata the quantity of water that can be represented by 85.8 beneath the littered surface, whereas the water from the unlittered surface would be represented by 56.5. These figures

the water supply in a forest is slower but more durable and copious than in open, forest-covered regions.

It has an influence on the flow of water above ground. Vegetable growth and layer of leaves aid in restraining the onward flow. This occurs only on the low land and in the high land. The opposite is not the case at

Government Officer Growig has made the following experiments with regard to the relation of the water to the forest: Five ounces of dry moss were placed under a glass in the first minute they absorbed 30 ounces of the water. In the following 9 minutes $1\frac{1}{2}$ more ounces. A quantity of this sort would then contain at least 4.47 more ounces of water.

In the mountains the quantity would be 10 m. m., showing what would be retained between the stems and the moss by capillary action. On account of this a forest covered would have a water strata of 2-3 c. m. in a

a quarter of a mile long can retain from 1,000,000 to 10,000,000 c. b. m. of water. The author remarks the following: It estimates a difference of 20-30 c. b. m. in the water flow on the surface for a quarter of a mile, will decide whether water will be injurious or not. The treeless surface would from 20-30 c. b. m. fifteen hours sooner than the forest with forest. If one remembers that the floods are of short duration, then it will be discovered that the water in a moss-covered declivity has an important function. Where the forest should be naturally, it should be prepared for. The height which would otherwise be unprepared for. The height which would otherwise be unprepared for. The steep declivity will be of benefit to the water

the undisputably proven cases on record where the effect of the forest or the planting of trees has an effect on the water supply. They are somewhat scarce. They are obviously occasionally. In France and in Switzerland there are many examples. In consequence of the cutting away of the forest the flow of water became so irregular that the factories had to stop during a large part of the year. As soon, however, as the forests grew, this condition was changed. Just how much the forests have upon the general health has not been determined. It is desirable that the mountains and slopes be covered with forest on account of their effect on the climate. The forests could be used for general culture. This would nat-

urally be the case, and yet a third or a fourth should be devoted to forest culture. That the country can not flourish without timber should be known by every farmer. Let every one be engaged in planting trees and extending timber culture, not only because it will benefit the present generation but because its effect will be lasting and of benefit to generations to come.

EXPERIMENT STATION AT MINNESOTA CITY.

By O. M. Lord, Superintendent.

The appointment of these stations by the State Horticultural Society was no doubt one step in the right direction. Reliable information in regard to new fruits is difficult to obtain, and the best manner of cultivating such as we have, can not be determined without thoroughly testing under different conditions of soil, location, and methods.

When this work reaches its highest point of usefulness, we shall be able to plant with some assurance of success; instead of wasting time, money and labor, with what is worthless when grown, or with what will be likely to result in failure if ever so desirable. The results of some experiments have become of very great importance, having changed the entire character of some productions. Notable examples are the Early Rose potato, the Concord Grape, The Wilson and Crescent strawberries, etc.

These stations having been organized by the State Society are supposed to be largely engaged in the interests of the public; but having barely entered the formative stage, no great progress has been made, and consequently no elaborate report can be expected. One of the first difficulties we meet is the want of means. New fruits cannot be had without money, and we do not know that the results will justify the outlay. It may be well for the Society to indicate, by resolution or otherwise, what means are to be used and what course is to be pursued on the part of these stations; that we may have some uniformity of action, and also be informed as to the direction of our individual efforts. Methods of culture may be left entirely to the experimenter, but varieties may well be considered by the Society, and distributed according to location, facilities, etc. In addition to the general culture required, each station might be given a specialty if thought best.

As no instructions have been given, and as a matter of taste

and convenience, this place has been started with native plums as a specialty. About twenty varieties are now growing. Additions were made last spring of *Prunus Simoni*, Mariana, Robinson and some others without names, but having some local celebrity.

In a late report, Prof. J. L. Budd says: "Whoever grows *Prunus Simoni*, expecting a good dessert plum, will be disappointed, but it is very good for cooking." It is doubtful if this plum will stand our climate. We have a good list of natives, excellent for cooking, but not very desirable for general planting. From present appearances, none of the Chickasaws will succeed as well as the De Soto and several others of this vicinity.

EXPERIMENT STATION AT ROCHESTER.

By A. W. Sias, Superintendent.

Mr. President:

In referring to my report of this station, made a year ago, I see I made a mistake in not heading it "*An Obituary Notice.*"

The mortality was so sweeping in its results two years ago that we have but little to report upon at this time. But in this great loss we are again forcibly reminded of that saying, so full of meaning to the intelligent horticulturist, "the survival of the fittest." We are also reminded of another saying sometimes found in obituaries, viz.: "Death loves a shining mark." This also has great weight and significance with observant students of our Northern trees and plants. If you happen to have a tree in your orchard that has a thin leaf, with no hirsuteness about it, one that the sun can shine clear through with no obstacles in the way, then rest assured, "death loves that shining mark and will close its arms around it."

Without stopping to itemize, will say that all of our trees with thick pubescent leaves came through the severe winter two years ago in good shape, and have behaved first rate ever since, notwithstanding they had to pass through a "fiery ordeal" last summer. Such trees are equal to every emergency.

The thick leaves of such hardy American seedlings as McMahon White, Giant Swaar, Brett Seedling and some others would indicate Russian blood. The Brett Seedlings are straight, fine-growing trees, and promise well. They are supposed to be from the seed of Talmon Sweeting, fertilized by Duchess. The tree of

McMahon White resembles the American Golden Russet very much, while the leaf would pass for a good Russian.

Please to bear with your servant while he gives a little "fatherly advice" to other experimental stations. It is this—put in at the time you can possibly afford to do in growing all the different varieties of fruit that are hardy in our climate *from seed*, and as far as possible, select your seed from *thornless varieties*. Let the apple seed come from the thickest and most pubescent-leaved tree, providing the fruit is good, and if the leaves are of an upright habit, all the better.

I discovered a thornless blackberry in our county last fall hardy enough to carry a good crop without having been covered. I am in correspondence with a certain horticulturist at Columbus, Ohio, who claims to have a collection of over forty varieties of the blackberry, and I have made arrangements with him to furnish me with a start of each of his thornless varieties, and also the Lucretia Dewberry from the original stock, so in the spring I am in hopes to be in condition to make a specialty of thornless blackberries.

We also have received a few plants of the Hardy Blackberry for experiment from DeWain Cook, of Cottonwood County, Minnesota.

F. K. Phoenix, the veteran pomologist of Wisconsin, had the kindness to donate a few choice new varieties of the apple for my experimental station, a year ago last fall. Among them were Shields' Crab, Stubbs, Rucker, and others. They appear to be hardy and all right, so far.

The Ostheim Cherry, from Chas. Luedloff, is still in a flourishing condition. American Yew is a hardy, native dwarf. I set a plant of it in an exposed place on my grounds some twenty years ago. It lived several years, and fruited, but finally died, as I believe from drought. So last year I set several more, but put them where they were well shaded by large evergreens. In such situations I have no doubt they will do well, especially if kept mulched.

We have a fine lot of yearling Shellbark hickory trees, grown from a basket of nuts sent us by John S. Harris, and grown on his grounds, and said to be superior to the ordinary hickory.

D. S. Grimes, of Denver, Col., who gave us such an interesting and instructive paper for our last report on "Coniferous Trees of the Rocky Mountains," also gave us at our state fair and at the Southern Minnesota fair, at Rochester, some of the

markable "object lessons" consisting of exogenous plants best fitted by nature to withstand a long and severe winter anything, perhaps, we have ever seen. I allude to the exhibit of many varieties of the Cactus family from Colorado. It occurred to us that we might possibly suggest from these "Children of the Sun," in respect to a leaf we wanted in an arid situation for which we come to look the subject up we find there are five species of the Cactaceæ, all natives of America, and all leafless. But in lieu of leaves they have clusters of prickles in great and "touch-me-not" abundance, as we know to your sorrow and your neighbor's delight. It is well known that the most of our Northern trees would die if deprived of their "summer clothing" for a single season, hence the question arises to our botanical knowledge, whether these little hairs, or spines, possess the characteristics of ordinary leaves and perform all of their vegetable functions? This question is shown, first that people who have not made a regular study of any, and have no five hundred-dollar-microscope to show but little about leaves or their uses; second, to the necessity of appointing at this meeting a committee of scientific botanists to give us next winter a paper on the comparative value of thick and thin leaves,

Douglas is doing a most praiseworthy work in introducing this Northwestern country hardy evergreens from the mountains. I put on trial at this station, last spring, each of *Picea pungens* and *Abies Douglasii* from a number of seedlings, with satisfactory results.

EXPERIMENT STATION AT LA CRESCENT.

By J. S. Harris, Superintendent.

Report and Members of the State Horticultural Society:

We report that we are making progress slowly. We have made a few additions to the varieties under trial since presented at the last annual meeting. Among such are a few of Ostheim Cherries from Chas. Luedloff, doing well; a few cions of Darrt's hybrid apple; doing well. One's favorite plum, top worked on wild native, has done well.

Have not made any additions to the Russian or seedling varieties of apples, except one tree of Gideons. Of the varieties reported last year none seemed to be injured by frost last winter, although upon one day the mercury reached as low a point as any time in twenty years.

The Giant Swaar, Rollins' Pippin, Wabasha and McMahon's White appear to have ripened up the season's growth as well as the Wealthy, Red and the Yellow Anis and one or two other varieties of Russians, from Sias, appear to be in the finest possible condition and I think some of them will show fruit the coming season. Of the Russian trees procured from the Iowa Horticultural station, thirteen varieties in all, a few have made a fair season's growth, while some are not perceptibly larger than when planted two years since. Of Ostrokov's Glass, four trees have made the finest growth of any, and of the Antonovka, four trees, the next best, of the Anis family nearly as good.

SMALL FRUITS.

The Cuthbert raspberry produced a fair crop of fruit without having had winter protection, and we have left a portion of them up again this winter to continue the comparison of hardiness with the Turner. When frosts set in they were well filled with blossoms and fruit in various stages of growth, which was probably caused by their starting into growth after being prematurely ripened up by the drought. With the Turners, but few canes had made a second growth. We are satisfied that both varieties are better in this climate for having winter protection. Blackberries were laid down and lightly covered with soil, and, although considerably injured by the drought, fruited very well; Snyder being several days the earliest, gave the most fruit. Ancient Briton gave the best quality of fruit at the first pickings, and but for the drought would have yielded the most. Stone's Hardy was the latest and poorest of all; but had we been favored with rain would probably have matured a fair crop. Our two plants of Wilson Junior blackberry were very unsatisfactory. They bloomed well, but did not seem to get properly fertilized, and did not mature a perfect berry. We are well pleased with the Ohio raspberry and think it promises well for the clay loam soils of this part of the State.

A few one-year root grafts of the Brett seedling apples wintered well, and the variety named Hart is making a strong, vigorous growth.

In strawberries the old Ironclad was the earliest to ripen and the first berries were fine, but the main crop was cut short by the drought. The Foundling appeared to resist the drought best of all, and retained the vigor of the plants to the last, but we have too few plants to decide upon its merits. Sharpless and Cumberland Triumph were very nearly a failure; Jas. Vick better than the previous year but hardly satisfactory. The Crescent, fertilized with Old Ironclad and Wilson, gave the best results of all.

PLUMS.

Our native plum trees are all doing well. The De Soto bore some fine fruit which was awarded the first premium at the state fair. It is a good fruit and has been sufficiently tested to warrant its being recommended for general cultivation in the eastern and southern parts of the State.

Our facilities for testing varieties and conducting experiments are better than ever before, and we intend, as fast as possible, to secure every variety of native plum, and in conjunction with O. M. Lord, of Minnesota City, whose soil is very different from ours, to give them a most thorough trial, and also to commence raising seedlings from them, selecting with the view of originating improved varieties.

RECOMMENDATIONS.

In closing our report we take the opportunity to urge the establishment of more systematic experiment stations for the testing of varieties upon varied soils and assigning to different individuals such portions of the work as they seem best fitted for conducting and would request detailed written annual reports from each. Thus far our experimental work has been a labor of love, performed at private expense by generous individuals who could ill afford it.

Our State is rapidly increasing in population and wealth, and good fruit in abundance is one of the prime requisites of happiness and prosperity, costing too much to be imported from other states. In view of this fact we ought to be able to induce our state legislature at the present session to increase the appropriations to our State Horticultural Society that the stations might be increased and the line of work extended. Trees, shrubs, plants and seeds ought to be furnished to these stations without cost to the managers, and the Society ought also to be

able to offer premiums to encourage the production of new seedling varieties, the planting of groves and shelter belts and the outward ornamentation of school and other public grounds, and even farmers' homes. All of which is respectfully submitted.

CARVER COUNTY EXPERIMENT STATION.

By Andrew Peterson, Superintendent.

I can not send any apples to the exhibition to be held by the Society in St. Paul, because they are all gone. Apples don't keep this winter as well as they used to do. I don't know what is the reason; I kept them in the usual way, and they were all rotten at Christmas time.

As I am not well enough to come to the meeting myself, I have to give a written report concerning fruit, but I have not any report of particular value to give. The Russian Hibernial, Ostrokov's Glass, Charlamoff, and Winter Lowland as usual bore a heavy crop of fruit. The Christmas apple, Red Cheeked, did not bear so much. Winter Pear tree is half dead, but had a heavy crop of large-sized, middling good fruit. Duchess had a heavy crop; some of the trees are damaged a good deal, but some of them will recover. All the Wealthys are half dead and the apples were very small and don't keep as long as usual.

SMALL FRUIT.

Raspberries — Philadelphia and Turner had a very nice and heavy crop this year.

Strawberries — Wilson: I never had so nice and heavy a crop of them before. I think that was dependent on the manuring I gave them from the chicken house.

All the young trees of the new Russians, about thirty-five varieties, look very nice; also the Russian pear trees show no damage yet. Among the sixty varieties imported from Sweden there is only one among them which is hardy enough for Minnesota climate.

EXPERIMENT STATION AT LITCHFIELD.

By G. W. Fuller, Superintendent.

The only cions received for trial were from the Russians, obtained from Mr. Andrew Peterson three years ago by Mr. Gibbs. These thus far have proven perfectly hardy.

to the State they would favor the adoption of the fruit and forest trees from Prof. J. L. Budd, of , are very promising, but it is too soon to estimate value. We propose still to "experiment."

EXPERIMENT STATION AT MOORHEAD.

By R. M. Probstfeld, Superintendent.

ation of my meagre report this year I would refer report in 1886 (see page 332, volume 14, of the Society.)

RUSSIAN VARIETIES.

to the varieties of Russian apple trees on trial at I would state that in addition thereto I received J. L. Budd, of the Iowa Agricultural College, Ames, following varieties of Russian apple trees: Two, 30 599; Five, †984; Three, *200; Ten, 26 M.

trees have done well, notwithstanding the dry, hot They went into winter quarters with wood well but it is impossible to state at this date what effect winter had on them, but on examination of them I hopes for all, including those received from A. W. G. Tuttle.

plants bore a heavy crop last summer, but the blight them out very fast. I am now corresponding with off, of Carver, and he offers to send me his entire col- promise to undertake the task of testing them.

SMALL FRUIT.

es (Turner's Red) came out all right from the winter ripe fruit on account of heat and drought last sum-

(Red and White Dutch), good crop; have no others o far.

ries having failed with me on account of hot, dry e critical time in summers of 1883, 1884 and 1885, oned their culture, but there is no trouble to winter very slight covering.

30 M., M. means Moscow importation; a star (*) indicates Prof. Budd's numbers, Department of Agriculture numbers, as given in Iowa Agricultural College of. Budd.

Gooseberries I abandoned; had Houghton's Seedling; they did well for about three years, but the winter of 1884-5 was too much for them. They sprouted from the root again, but I considered their place worth more than the berries, and dug them out. I would not discourage whoever wants to try them. I think they are hardy enough for most winters we have here.

I have also the Cottage and Coe grapes from Prof. Budd. Out of ten set seven lived last summer; but they did not ripen their wood well last summer — planted in May, 1886. When I covered them, November 1st, they looked badly. Can not tell how they will come out. Am of opinion that it is safe to cover grape vines here about October 20th.

I will here add that I have great faith for the hardiest Russian apples in this climate.

STATE EXPERIMENT STATION.

Mr. Cutler presented the following preamble and resolution and moved its adoption:

WHEREAS, The legislature of Minnesota at its last session passed a law, requiring the regents of the State University to establish an agricultural experiment station in connection with the college of agriculture of that institution; and

WHEREAS, Such an experiment station has been established and put into successful operation and the work then begun promises to be of the greatest advantage to all departments of agricultural work, and

WHEREAS, This work has been performed under difficulties, owing to a want of specific appropriations. Therefore be it

Resolved, That this Society earnestly request the legislature to make such provision for this station as will enable it to perform such work in original investigation and experiment as will keep our State abreast of the communities in everything pertaining to agriculture.

Mr. Cutler stated there had been a feeling manifested in certain directions that no benefit was being derived from the agricultural college of the State University and in favor of a separation of the two institutions, and referred to the action taken in this regard by the State Farmers Alliance; a desire was expressed that something practical and tangible should be accomplished; as a member of that organization he had voted for such separation. The agitation of the subject would perhaps prove a benefit, as there had been a change of sentiment with regard to this matter. It was believed that something tangible would be secured from the agricultural college as at present conducted; otherwise there would be a separation, or the institution would be abolished. He agreed with what had been said by President Northrop that there were too many state institutions. With proper legislation to facilitate the work and plans of the agricul-

tural college he thought practical results would be speedily secured.

Mr. Dartt thought there should be action taken in this matter without delay.

Mr. Gould said it was best not to make haste too rapidly in this matter, and it was better to see where we were likely to land before "we jump." He was not prepared to vote for the resolution at present.

Mr. C. L. Smith said nothing was to be gained by delay. No reading and thinking man who had given the subject attention could have failed to comprehend the situation. The question as to the propriety of a separation of the agricultural college and the university had been thoroughly agitated. If the members of the Society were in favor of the legislature giving encouragement and support to the experiment station to make it a success resolution; if on the other hand they were in favor of tying the hands of its superintendent so that he could accomplish nothing they would oppose it. For one he was in favor of its adoption.

Prof. Porter said the state legislature had passed a law requiring the establishment of the experimental station but had thus far failed to make an appropriation for carrying on its work. Other states were aiding similar stations by liberal appropriations, and there was no other way to give it the efficiency for accomplishing the work required except by the methods indicated.

The resolution was adopted.

Reports from members of the General Fruit Committee being in order the following were presented:

REPORT FROM WABASHA COUNTY.

By Sydney Corp, Hammond.

S. D. Hillman, Secretary, etc.:

As a report is desired from me with regard to my method of preserving fruit I send you the following: I can only account for my apples keeping well by the plan I follow of picking and preserving them. Owing to the hot, dry weather, which advanced the ripening process, they have not kept as well as usual this season; and they may have been left on the trees too long before gathering them.

My way of gathering my winter apples is to go over the trees about three times, first picking the apples that grow in the sun

and are ripe; then in a week or so to go over them again, gathering those that have ripened, letting those in the shade and on the under side of the trees stay till they are ripe. One needs to exercise care that they do not get too ripe, for I think here is where we sometimes make a serious mistake.

Again, if we gather all the apples on a tree at the same time, especially the Wealthy, about one-third of them will usually be found to be too ripe to keep for any considerable length of time, while another third will be so green as to lack in flavor.

I prefer putting my apples in a cool, dry cellar, as soon as gathered. My cellar has a thick stone wall outside and is lined on the inside with one thickness of brick, with some two inches of air space between the walls.

I have kept Wealthy and McMahon White apples in my cellar, in good condition, until well into the summer months.

REPORT FROM FREEBORN COUNTY.

By Clarence Wedge, Albert Lea.

My report as member of the General Fruit Committee can not rank with the reports of those who make the growing of fruits and flowers a specialty, but must rather be considered as the observations of one who, although keenly interested in horticulture, depends for his livelihood upon the general products of the farm.

The seedling orchards of this county have proved a complete failure. I have seen and heard of a great many seedlings but do not know of one that to-day is worthy of mention. Indeed of standard apples there is but one that stands the test of time and is everywhere a success, and that is the Duchess.

And now, since we have no way of judging of the future but by the past, and since in the past everything of value has come to us from Russia, will it not be wise in us to pin our faith to that noble list of apples which has lately come to us from the "Upper Mississippi Valley" of Europe?

This endless experimenting without results is wearing out the patience of our planters. Some of these new Russians are pretty well out of the experimental stage even in this country. Why should we not accept the work of centuries which the Muscovite has sent to us, and with this firm foundation go on improving?

GRAPES.

Our grapes were a very complete success last season. We have about one hundred and twenty-five vines planted, about two-thirds of them in bearing. Agawam, Massasoit, Lindley, Champion, Moore's Early, Delaware, Concord, Cottage and other varieties are represented, and have fruited. If I was limited to one variety I should choose the Cottage, a sweet, meaty grape resembling the Concord in style of growth and very much earlier. Of the above varieties the Concord ripened the last of all, and in most seasons barely escapes the first freeze. My method of raising grapes is the simplest possible, and consists in a word of a sunny spot, cultivation as for corn, a wire fence trellis, cane renewal pruning, summer pinching back to the third bunch, covering with a little dirt for winter, and last, but not least, standard varieties.

I find that one of the great drawbacks to the success of this fruit among the farmers is their habit of buying one or two vines, at a dollar or two apiece, of some of the new varieties that no one, not already well supplied with fruit, has any business to experiment with.

Another reason why more grape vines are not planted is the idea generally had that deep trenching and manuring, and a deep insight into the mysterious art of pruning are necessary; while in fact very simple methods are quite successful.

My advice to farmers would be to plant in a sunny, moderately rich soil, a dozen vines of Concord, Cottage, Worden, or Moore's Early, eight feet apart each way, to make the acquaintance of his nearest grower, look over his vines, young and old, and he will soon get the few ideas necessary for him to raise enough of this luscious fruit for his family supply.

In these days, when old Borealis is ruling with a high hand, driving the cattle to their shed and the farmer to his fireside, and piling up snowy monuments to his fury, let us think how we can raise barriers to his authority, and resist his cruel monopoly. Some few have had the shrewdness and energy to oppose great banks of pines and spruces to this wintry foe, and now they and theirs live in quiet content with the healthful climate of our State. We must "educate the masses" on this subject. The natural winter climate of the prairies of Minnesota is a howling wilderness of snow and ice; under the protection of evergreens the same situations are sunny, quiet, and only 40° below.

REPORT FROM CHIPPEWA COUNTY.

By O. E. Saunders, Granite Falls.

I regret very much that I am unable to attend the meeting of the Society, but duty calls me elsewhere. I notice that a report is expected from me, so I send a brief one.

The past season was a severe one on fruit in this section. The severe drought came on so early in the season that it was disastrous to both plant and fruit. A very large per cent of newly set plants and trees were killed outright, as they dried up before they had become established. In favorable locations the strawberry crop was good, but in dry situations it was much injured.

Raspberry canes, especially the reds, were badly killed back, which weakened them so that they were not able to set a heavy crop, and the drought prevented the perfection of much that was set. In the early spring the canes looked all right and gave promise of a good crop, but in April we had one or two very hot days, and afterward they failed to start on the upper parts. We think this was more probably the cause of killing than the winter.

Currants and gooseberries gave a heavy crop.

There are but few grapes in bearing hereabouts, but they give promise of doing well under proper conditions and care.

Apple trees came through the winter in fair condition and have done fairly well through the season. But few standards are in bearing, yet we are still planting, and hope to make apple growing something of a success. We do not get very jubilant, over the prospect; but, on the other hand, we do not despair of success. We are endeavoring to study the conditions that surrounds us horticulturally, that we may make our labors a success. Of one thing we are very sure — no country can excel in quality and flavor Minnesota small fruits; so if the apple problem remains unsolved, we are not to be deprived of all home-grown fruits. Success to the "State Horticultural Society."

REPORT FROM MEEKER COUNTY.

By G. W. Fuller, Litchfield.

The past season, has been a very successful one with everything except the raspberries. For the first time the Turner failed us. The winter did not seem severe, but there was

something about the spring that destroyed the fruit and most of the bushes. In a few localities they escaped injury and bore well.

We had full crops of Early Strawberry, Transcendents, Beach's Sweet and Minnesota crabs, a very few Duchess and still fewer Wealthies.

Currants, gooseberries and strawberries were abundant and brought good prices.

REPORT FROM MURRAY COUNTY.

By O. F. Norwood, Balaton.

The past season was a very dry one with us, and it seemed that everything would be dried and burned up, but the apple trees tried to outdo each other in producing a big crop. We think well of the Transcendent. Each recurring year it brings its large crop and this year the trees could hardly carry their load. Currants, raspberries and gooseberries were a light crop, but strawberries were never better with us, but we made one discovery this year, that turkeys cannot be raised profitably on strawberries, so have abandoned the turkey industry and intend holding on to the strawberries. Grapes a light crop and of imperfect fruit owing to a heavy frost the latter part of May.

I will say in conclusion, that we feel very much encouraged by the fact that every tree and bush we have yet planted have grown well, and show no damage from either cold or heat. We shall keep on adding to our collection as fast as we can. Have on hand for spring planting eight of Gideon's seedlings and ten of different kinds of the Russians from Mr. Tuttle and expect to add about sixty more different Russians before planting time.

REPORT FROM RICE COUNTY.

By L. E. Day, Farmington.

MR. PRESIDENT: I have no written report and will make a short verbal one. Of standard fruits in our district the past year, the Duchess gave us a heavy crop. The few trees of Wealthy that stood the test winter bore a few apples, but there are very few trees that were uninjured, and the most of them were killed outright.

HYBRIDS, Transcendents and Hyslops were a very poor crop.

The Minnesota and Maiden Blush, Quaker Beauty and Beach's Sweet, all produced a fair crop, especially Minnesota. This may be opposed to the ideas of others, but I find the Minnesota in the vicinity of Castle Rock has been producing well for several years and appears to be very hardy.

SMALL FRUIT.

We had an abundance of strawberries. Raspberries did not seem to winter-kill but produced very fairly. Of the blackcaps, the Gregg has done remarkably well with us, and also some other varieties mentioned here. I have one variety called the Elmira, a seedling originated by Rev. M. L. Tibbets, which I consider about the best variety on my grounds.

REPORT FROM WASHINGTON COUNTY.

By M. C. Bunnell, Newport.

MR. PRESIDENT: I have no written report. During the past year, from what I have observed during my travels through the counties of Washington, Ramsey and Dakota, I find the principal variety of standard apple to be the Duchess. Wealthy was very badly injured by our hard winter of two years ago. Some orchards in the town of Woodbury bore good crops—one about fifty bushels of apples. I find Whitney is doing about as well as any variety planted in this vicinity.

A good many farmers are considerably discouraged with standard apples while others are re-placing their dead trees. As regards the crab species, Transcendent bore well, but the fruit did not bring a very large price; Hyslops brought a far better price than Transcendents, although the former did not stand well for hardiness.

PLUMS.

As regards plums, De Soto and Weaver give the best satisfaction of any variety planted in those counties and I am experimenting with them considerably. They seem to stand our climate and we have been much pleased with the quality of fruit produced and the productiveness of the trees.

GRAPES.

The grape crop in many localities was very good. Mr. F. C. Dick, of Washington County, has been giving some attention to grape culture and is succeeding well with a number of the

Rogers varieties. I was at his place when he was gathering his grapes and they were very fine and large. His market is Stillwater.

SMALL FRUIT.

I laid down my raspberries a year ago this last fall — Turners and Philadelphias — and of course they came out all right in the spring. The latter variety were badly affected by the drought and the fruit dried up before coming to maturity. I have Cuthbert but it has not yet fruited. I find it pays to lay down the canes and give them protection in the winter.

There has not been much done as yet with blackberries. Mr. Ford, of Newport, has one or two varieties. the Lawton and perhaps Ancient Briton. He gives them protection by covering the canes.

Of strawberries, Wilson and Crescent are the leading varieties in this vicinity. The crop produced was very fair, but prices were lower than usual.

REPORT FROM HENNEPIN COUNTY.

By N. J. Stubbs, Long Lake.

The "survival of the fittest" seems to be well illustrated in trying to produce ironclad varieties of apple trees that will withstand the ordeal of our terrible climatic influences and is as true in this department of evolution as in the animal and human kingdoms.

History, I think, will demonstrate to anyone that wherever civilization has planted her standard for any length of time, the product of the orchard and garden has likewise been found. Therefore, our climate can be no exception to the general law. The coming generations will, therefore, consummate what some have so nobly begun. This seems to me no guess work, but a future certainty and should encourage everyone to this end.

I may say there has been but few apple trees planted in this part of the county the last year. As a standard, everything considered, the Duchess of Oldenburg stands at the very head; Wealthy next. Crab apples: Virginia, Transcendent and Whitney seem to succeed the best, and are the most valuable in order named. These varieties have all done very well and have borne some apples every year, especially when planted on high clay soil and heavily mulched or cultivated. If those who are grow-

ing apple trees knew how important a heavy mulching of chips, cane bagasse, or anything to hold the moisture is, it would not be neglected.

SMALL FRUITS.

Strawberries are grown more extensively here than any other fruit, and the industry seems to be steadily on the increase, withal the prices ruling so low. The last two seasons the varieties that gave the best results are Crescent seedling, Wilson, Capt. Jack, on clay soil; on sandy loam, Crescent, Manchester, fertilized with Sucker State, and Downer's Prolific, properly fertilizing being the true secret of success with pistillate varieties. If we wish to be successful in growing small fruits, we must adopt the "intensive" plan, plant only what we can cultivate and do it well; then we may expect to command a paying price in our markets — not otherwise.

So far as I have noticed, raspberry culture has not been very successful, in consequence of our finest berries being too tender to stand without winter protection. The majority of people think this will not pay.

I was talking with a neighbor, a Swede, who had about half an acre of Turner and the same of Philadelphia; he gives high cultivation, keeps the hills thinned to only three canes, gives no winter protection; claims he obtained \$5 per 24 crates for Turner. The Philadelphia he makes into wine that brings him \$3 per gallon. This shows what good management and skill will accomplish.

Souhegan is the hardiest and best blackcap raspberry, that I have seen tried. It is very early, wonderfully prolific, and very good quality when fully ripe. The Marlboro has made a vigorous growth the past season and borne a few large handsome berries which look very attractive, but in quality I call it poor. The Cuthbert for red and the Gregg for black, planted out and given good cultivation and protected over winter, will always command a fancy price in our markets, and will repay for the protection.

Red Dutch currants for profit, certainly stands at the very head. Fay's currants have borne some fruit, which is very large and attractive, but I doubt very much if it will ever supplant the old stand-by; its flavor is very poor; that, I think, will always prevent it from becoming popular. However, it may prove to be more valuable on further trial. The White Grape currant is

a most valuable fruit. Its beauty and excellence is not yet appreciated, I think, here in this part of the county at least. Victoria has large, nice clusters, and will hang on the bushes the longest of any variety without taking harm.

The currant is being planted more the last year or two and will always succeed better than most other fruit in consequence of its generosity, always giving you fruit with ever so poor treatment. I must add that Stewart's seedling currant is likewise very valuable on account of its large size, good quality and productiveness, and will be planted largely when its value is better known.

GRAPES.

The past season has been a great year for the growth and ripening up of grapes in Minnesota. I have been raising grapes for fifteen years and have not seen a better one. The season being so dry but little disease made its appearance on the vines. The Delawares still take the lead in planting for market. I think Moore's Early and Worden will largely supersede the Concord for market in this climate. Of the newer grapes the Empire State, Jessica and Niagara, have made a nice growth of well-ripened wood, promising me some fruit another season. But the planting of the vine is limited to certain localities, and to a few enthusiasts who are in love with the calling; not but what our earliest, hardiest grapes can be grown in many localities all over our great State, but extra care and attention are demanded to succeed in this direction.

Then let us ever encourage planting the vine both by word and deed, so that when our labors on earth are done we may know one little spot has been made more beautiful and fair by our having lived.

REPORT FROM RAMSEY COUNTY.

By Wm. E. Brimhall, St. Paul.

Apples in this county were a light crop, rather under size and irregular in form. The Duchess is the hardiest variety and they winter kill more or less every winter. While young and healthy they are the most profitable fruit grown here. To grow them successfully requires a high location and good cultivation and the trunks of the trees should be shaded from the sun. A piece of a fence board, four feet long, sharpened and driven into the

ground on the south side, before freezing of the ground, answers a very good purpose. Wealthy comes second on the list. It is very productive and often overbears so as to injure the trees and should have its fruit thinned out well while very small.

The two above named varieties are the only ones that I find pay to grow for profit. The Transcendant crab of all others is the best and [most profitable one grown. It is hardy, bears young, and is what our people most universally like; more of them are grown and sold in this market than all other varieties together.

SMALL FRUIT.

Strawberries came into market the twenty-ninth of May, being about two weeks earlier than usual. The crop was a very good one and the berries were as fine as can be produced in any state on the continent. Wilson and Crescent seedlings were the most abundant, old Ironclad made a very good showing; Downing on light soil was fine; Glendale gave a good yield, but was not a favorite with many.

Of raspberries three varieties principally are grown. Philadelphia for productiveness is in the lead; Turner is the sweetest; Cuthbert is the latest and largest but is tender and requires covering through the winter to insure a good crop.

Currants were a fair crop; the late varieties, such as Prince Albert and Long Bunch Holland, prolonged the market season and commanded remunerative prices; Baily's White Sweet is another very productive variety and sells readily in market.

Gooseberries are very little grown, but are considered a paying crop, especially the American varieties, such as Houghton and Downing seedlings; Downing is extra large and showy.

Grapes were a medium crop, being injured by the late frost in spring. The season being a long one, most varieties matured and ripened their fruit. Concord still holds its own place as the best grape for the million. Delaware is yet the best table grape, while Rogers No. 4. is an excellent grape worthy of more cultivation. Its bunches were the largest of any on my grounds; the berries also were very large, handsome and nice flavored. Also Rogers No. 33 is an excellent grape on high land; both should be kept well pruned and the laterals pinched back, and only two bunches allowed to grow on one spire. All grapes need a southern exposure to insure early fruit.

Now, at this writing, as I am in San Diego, California, the

land of grapes and sunshine, I will say the modern style of growing grapes is quite an improvement. The first year's growth is cut back about one foot above the ground, which is as high as they are allowed to grow. The canes starting out on an angle reach the ground and produce wonderfully fine bunches resting on the ground, many of them, which, owing to the dryness of the climate and soil, do not become gritty or injured by resting on the soil and were as sweet and luscious as any that I have ever tasted. Am told that some clusters grown here weigh as high as eight and even twelve pounds. This is *hearsay*. I came here for the climate and the climate I feel is doing me great good. It is a mild, genial, health-giving, life-preserving climate. If it could be transported to Minnesota it would be a perfect Paradise—all that heart could desire.

I long to be with you at your winter meeting, but health will not permit it. Hope your meeting will prove to be a profitable one.

REPORT FROM WINONA COUNTY.

By Wm. McHenry, St. Charles.

Mr. President, Horticulturists and Friends:

As it was my misfortune not to be with you at the winter meeting I shall try to comply with the wishes of your secretary, and in as brief a manner as possible, give you a glimpse of the fruit crop and its prospects in this, Winona, County. There is perhaps no county in the State that has such a diversity of soils and locations as this. While in the valleys and many localities all the standard apple trees have succumbed to the extreme colds of the past, and the croaker thinks he can truthfully say apples can not be grown in Minnesota.

On the ridges and in favorable localities we visited orchards in the fall of 1886 where we found trees of Duchess, Tetofsky, Wealthy, Wabasha, Rollins Russet and Pippin, loaded with fine fruit; and some seedlings. Many of the trees are looking healthy.

To prove the above it was only necessary to go on our streets in September and see the wagon loads of apples, and in quality such as Michigan would be proud of, such as Duchess, Tetofsky and a few Wealthy. Upon interviewing our shippers we find that five hundred barrels were bought and shipped and as many more were offered, but there was no market for them even at twenty-five cents per bushel. The biggest humbug of the past

that has been played on our people is the Russian Mulberry. In 1885 we had them grow seven feet, and the next spring they were dead to the ground. Last year they grew six feet, and now are probably dead.

The only fruit I have grown was on trees that were dug in the fall and buried over winter. They are good for nothing but to feed worms for silk culture; are a humbug as a fruit-producing or an ornamental tree.

The drought of last May, June, July, and part of September gave us a very poor berry crop. Strawberries, unless well mulched, were very small and of inferior quality. Crescent Seedling, Windsor Chief and James Vick doing the best of any on our grounds. Of red raspberries Turner withstood the drought best though Brandywine did well. Of blackcaps we had more dead bushes than berries. Our blackberries were the best paying berry crop we had, as our bushes were well mulched, the dry weather only made the fruit small; yet we got about two hundred bushels to the acre. For early we had the Snyder (medium), Stone's Hardy (late) and Ancient Briton. We have the Wilson Junior blackberry and Lucretia dewberry growing, but have not fruited them yet. There are over one hundred acres in this county in strawberries, about fifty in raspberries and about twenty-five in blackberries.

REPORT FROM WINONA COUNTY.

By O. M. Lord, Minnesota City.

The strawberry crop, on the whole, was considered a good one, though the late ones were somewhat damaged by drought. The market at all times was well supplied and prices averaged low. Wilsons, Crescents and Downers were the leading varieties. Red raspberries were plenty and generally sold at a paying price. In the Winona market there was an unusual demand for Blackcaps. Nearly all that came to market were under size and wanting in flavor, owing to drought. The early market in blackberries was supplied by local growers, and readily sold at fifteen cents, but large quantities were shipped in from Wisconsin and Chicago and sold to the dealers at one dollar and fifty cents per case of sixteen quarts.

There was a fair crop of Duchess and Tetofsky apples on the high or ridge land, and generally a good crop of crab apples.

From the sales made of small fruit plants and apple trees, in this county during the last year we may conclude that the people are not wholly discouraged in fruit raising.

From careful inquiry it is believed the sales amounted to over \$5,000.

Some of this stock was worth more when delivered, than it will be in the future, as it was purchased of the typical tree peddler who, "though now lost to sight is still in memory dear." He is, however, entitled to some credit for awakening an interest in fruit growing.

Young trees and small fruit, though unprotected last winter, were not injured to any great extent, and from the increased inquiry for trees, and general interest shown in horticultural matters it is hoped we may reap a bountiful harvest.

REPORT FROM HOUSTON COUNTY.

By J. S. Harris, La Crescent.

The season of 1886 was noted as being the dryest on record since the settlement of our county. Nevertheless the earth yielded liberally of fruits to such as had set trees and plants and given them good tillage. Strawberries promised to be immense, and proved to be an average crop of the finest quality we have ever grown. The Crescent where properly fertilized gave the best results. Manchester, on rich sandy soil, produced a large crop.

Raspberries of all varieties bloomed well and set fruit for a large crop, but owing to the extreme drought, matured only about half a crop. The red species have done better than the blackcaps. Turner and Cuthbert are the best red varieties with us.

Blackberries were also considerably injured by the drought and perfected on the average less than half a crop—the quality varying according to the summer mulching given them; where neither mulched nor cultivated the fruit was small, hard and sour. Ancient Briton is getting to be the most popular with us, but the Snyder, ripening earlier, gave the most fruit.

The crop of grapes was average in quantity and very superior in quality. All varieties ripened their fruit well.

The crop of apples was not large owing to the great loss of trees during recent hard winters. The varieties are pretty

much confined to Duchess, Tetofsky, the Siberians and hybrids; Wealthy and several of the newer Russians are being planted freely.

Many of our farmers are anticipating wonderful results in the near future, as the agents of the L. L. May & Co., St. Paul, Nursery have been through here selling quite freely of the Gideon and other "ironclads," and some fellows from down south, representing the "Sparta, Wis., Chain Nurseries," have helped out the assortment by inducing them to buy liberally of "budded" and "whole stock" trees. (They are made hardy by this process, you know they say.) There may possibly be one drawback to these chain nursery trees, as unfortunately the Chicago, Milwaukee & St. Paul Railroad has two routes, and they were shipped via Savana instead of via Sparta.

INSECTS.

Some of the insect enemies were more numerous and destructive to our trees and fruits than usual, the dry season seeming favorable for their development. The tent caterpillar has been the most conspicuous and has done great injury to the fruit and shade trees, and even to berry bushes, by nearly defoliating them, and marring their beauty by the multitude of their webs. They live in communities of three or four hundred individuals, under a common web or tent, which is made against the trunk or underneath some of the principal branches of the tree. The eggs from which they are hatched are placed around the ends of the branches by a moth during the autumn, forming a wide kind of a ring or bracelet, consisting of several hundred eggs in the form of short cylinders standing on their ends close together and covered with a thick coat of brownish waterproof varnish. The young caterpillars emerge from their eggs about the time of the unfolding of the leaves, or by the middle of May, and the first sign of their activity appears in the formation of a little angular web or tent, somewhat resembling a spider's web, stretched between the forks of the branches a little below the cluster of eggs. They remain concealed under the shelter of these tents at all times when not engaged in eating. As they increase in age and size they enlarge their tent, surrounding it with new layers or webs, until it sometimes gets a diameter of eight or ten inches and a length of sixteen to twenty inches. They come out at stated times to feed and all retire at once when

their regular meals are finished. They take two meals a day, generally between 9 and 12 A. M. and 3 and 6 P. M. They get their growth about the middle of June, when they separate from each other, wander about for a while and then get into some place for shelter and make their cocoons, after which they are finally transformed into moths or perfect insects, when they deposit their eggs, just as the preceding generation had done.

The remedies are, first, look over the trees in the latter part of winter and destroy all clusters of eggs wherever discovered; second, destroy the nests wherever found. This can be done readily with a long mullein stalk (a plant that is apt to be found in abundance upon farms where this worm has been undisturbed), or a brush of twigs affixed to a long pole. When the caterpillars are beaten to the ground they can be crushed or as they collect together on the trunks in their last moulting period they can be slaughtered in great number. While young and tender they may be crushed in their nests by using a brush, small mop, or sponge affixed to a long handle and it will be all the more effectual if frequently dipped into a bucket of soap suds or whitewash during the operation.

The apple curculio or gouger was more numerous and damaging than ever before known. In some orchards three-fourths of the fruit was nearly ruined by them. Space will not permit me more than to allude to them. Unless remedies are soon adopted for their destruction the growing of apples will have to be abandoned.

The codling moth is on the decline; the proportion of wormy apples was much less than usual; probably some parasite is preying upon them.

Aphis of several species were unusually numerous and injurious; plum trees suffered severely from their attacks.

The grape vine flea beetle and grape curculio, both put in their work and did great damage; they need investigating.

Every variety of fruit we grow has its insect enemies, and as it seems our State is too poor to employ an entomologist to study them up and impart needful instruction on methods for heading them off, our farmers will soon have to purchase their supply of fruits or go without.

The following paper was then read :

ROSE CULTURE.

By F. G. Gould, Excelsior.

There is no work on the rose, so far as I know, which treats of outdoor culture in a climate like ours. There is reason to believe that there is a lack of faith in the experiment of rose growing in our severe climate. It is true that June roses are grown very generally, but they bloom but once. They are the hardiest of all roses.

Next in hardiness are the Hybrid Perpetuals. They require winter protection. Among these are to be found some of the finest roses known. Gen. Jacqueminot is a good type of the class. Though not quite full enough to please us, its brilliant scarlet color makes it a favorite with all. It continues to bloom well into the season, gives a few specimens in the fall, is fragrant, vigorous and hardy.

Fisher, Homes and Louis van Houtee are darker and fuller roses than Jacqueminot, and, to my mind, of richer hue, reaching to that point of loveliness that would be impossible to excel.

Tastes vary in these matters, and I must confess that I am perplexed to decide which I like best when in the company of Baroness Rothschild, Eugene Verdier, Comtesse of Serenye and Caroline de Sansal, when in perfection. The last named sorts are of light shades of color. Alfred Colamb, raised from Gen. Jacqueminot, is a crimson rose of nearly as good color as its parent; better built, deliciously fragrant, medium size, and a constant bloomer into past midsummer and again in the fall. To get the best results this rose should be worked on the Marnetti, or some other vigorous stock, as its constitution is overtasked by its constant habit of blooming. It is a comparatively new rose, raised about twenty years ago, in France. I regard this as the most useful rose within my knowledge for garden ornamentation, bouquets or personal ornamentation.

Tea roses and hybrid teas are charmingly beautiful, none surpass them in sweetness of fragrance or daintiness of coloring. Perle des Jardins, Sunset and Bon Silene are some of the best teas. La France and Bennett are perhaps the most popular of the new class known as hybrid teas. All of these do fairly well in the open air, but require careful treatment in the garden to carry them through our winters.

The teas, Climbing teas and Noisette teas grow to perfection

south where the hybrid Perpetuals are nearly Moss roses thrive here, and with few or no exception inferior in the quality of their flower to the class above; most of them bloom but once in the season, June roses. The Salet moss, though not a superior of great value, covering all its defects by its most bit of blooming throughout the whole summer.

Bengals and Bourbons are neither of them up in quality standard of our views; though their color may be satisfactory; their petals are too fluffy and their lives too soon separated from the parent stem. These remarks apply particularly to the Bengals, though the Bourbons rarely win our admiration. These are commonly the monthly roses; they have their uses, as from artificial crosses between these the Damask and our grandest roses, have come. Who can say that this origin at the time of the crusades to the Holy land, as the rose should be more cherished by those chivalrous pilgrims on their return than a rose from Damascus?

The original stock of tea roses came from China. Their fragrance gives their origin away.

Our association does not admit of the mention of but few sorts of roses, the few classes named. Other classes and sub-classes have been omitted altogether, the chief object being to call attention to the comparative merits of some individual members of the association useful to us. Happily, some of the best can be grown in perfection here in the open air.

All created things nothing perhaps so touches the genius of our natures and more surely gains our affections as flowers. Their delicious perfume, beauty of form and coloring are suggestive to us of chastity and goodness.

HORTICULTURAL SERMON ON FLOWERS.

By Mrs. Anna B. Underwood, Lake City.

My friends and I of a young friend have suggested the subject, or rather for a horticultural sermon. "Please tell me, Mrs. U., how can we manage to have such a pretty show of flowers every year and all through the fall up to heavy frosts. There is no lack of them, no matter how dried and parched the soil, for I will fuss over and water and water; but no

flowers, and in spite of all they will die, and nothing to show for my efforts but the black earth, with here and there a dried-up plant, any thing else but a thing of beauty." Many besides this friend have made similar remarks, and I try to give them the benefit of past experience, but it too often proves useless, for no matter how forcibly the vital points of culture are placed before them, they are forgotten, failure follows, and they "never will try to raise flowers again" and so they must depend on their friends who have mastered the secrets of growing them successfully. But in this too, they often show a woeful lack of cultivation and refinement as they ruthlessly trample upon the plants so dear to our hearts, or pluck them with as little care as they would the commonest weed. Shall I ever forget letting a very dear friend go out by herself to pick some pansies, and my dismay when she came in with a large paper full of the whole branches of the plants? She said, "I tried to get all the green I could, the blossoms looked so much prettier." It is needless to say it was a good many weeks before I had many pansy blossoms. Some will pull a plant up by its roots, or break it off next to the ground or pick off so many buds with the blossoms that the show is checked for a long time. In order to keep up the beauty of the flower bed and at the same time have all the flowers one wants for decoration, they must be gathered judiciously.

The best teacher is experience, but there are those whom experience never benefits, one or two trials without success produces such discouragement that they settle back on the plea that they could never succeed, always had bad luck, etc. The old truism, "What has been done can be done again," should help every true lover of flowers. To love flowers truly is one great item of success. The mere liking of flowers for ornamental purposes cannot be construed into a love for them, while the love enjoys them wherever they are and is willing to sacrifice time and strength to grow them.

- So don't depend entirely on your more successful neighbor but go to work for yourself and learn the secrets of success. If there is a special variety that proves a failure with you, try different methods, think, read, inquire, compare notes with friends until you find out the trouble. Nine times out of ten it can be easily removed. Once in a very great while the fault is in the soil or exposure, but it is usually in the management.
- Never undertake too much, better select a small plat of ground

ut a few kinds until you have learned how to grow
ssfully, then add one or two kinds to your list, but
ard the old reliable varieties for untried ones until
roven them worthy.

ng seeds for a flower garden, choose only of the com-
es that flower continually through the season. For
nner I would suggest the following: One paper each
" white and scarlet Phlox, Verbena (mixed), Mign-
pacolum, Asters, Pansies and one ounce of Sweet
hese only Mignonette, Tropacolum and Sweet Peas
a in the open ground. The others must be started in
in boxes in the house. Then when your plants are
ed you can see how many you have and will know
ground to fit for them.

with regard to this. If the front yard is small, don't
with flower beds. rather go to the rear or side of the
ect a spot away from trees or large bushes, where the
ine all day. If trees are large, the roots will draw so
ure and life from the soil that plants will barely ex-
grow at all) when planted near them. If the soil is
ut on a liberal dressing of well-rotted manure and
ade it in thoroughly. Then with a line, lay the
into straight beds, four feet wide, leaving a path two
between them. Don't attempt any fancy beds and
them above the paths, unless the garden is in a very
ace, for you will want all the moisture that falls on
remain and not run off into the paths where it is not

e tenth of May, if the season is warm, set the plants
cold, or backward, wait a week or ten days. Plant
about one foot apart each way in the bed, pansies and
same. Verbenas need two feet, so they will have
ead.

ght to be set when they have four or six leaves. If
r they are liable to wilt and become stunted. Select a
, if possible, for setting. If, however, it is sunny,
he afternoon and water well. The next day shade
with leaves and remove the shade after two days. Do
fter the first week but keep the ground well stirred
be and free from weeds.

ground once a week for five or six weeks—after that
h to keep it free from weeds. Pick freely and ju-

diciously and you will have all the flowers you want for yourself and friends until frost comes.

Sweet Peas should be sown as soon as the frost is out of the ground, the same as common peas, in double rows, with brush between. Be sure and put the brush in before the plants are three inches high, as they commence to run very soon and will spread out on the ground unless the brush is there to support them, and so become stunted and will not cling to anything readily. Do not plant them by the side of the house or porch or around a bush, but give them the free and open ground, well cultivated. If you want them to flower all summer, pick off the blossoms before seed pods begin to form, as they waste the strength of the plant and it will soon dry up and die. It is better to buy your seed than to sacrifice your flowers by raising it.

The seed of the Tropaeolum or Nasturtium must be covered at least an inch and should be four inches apart. Plant in one long row allowing at least one foot on each side. They should not be shaded by near or tall growing plants, or they will grow too rank and run all to leaves. And last, but not least, a word for the pansies. Give them a warm place both in the ground and in your heart, for it is a dear, pleasure-giving plant, always responding so freely in return for a little care and attention. During the hot days of summer the flowers will be much smaller and rather faded, but if not allowed to seed, when the cooler days come in September, they will deepen in color and grow larger, and they will never fail you until the ground is frozen and long after all other flowers are gone. It is a gritty little flower, too, for when spring comes, just as soon as the sun gives it a chance, it is ready with its greeting of bright green leaves and buds already started. It is no common thing to pick some blossoms with the snow but a few inches away. The stem will be real short, not more than half an inch in length, but the little face is so bright and happy at the chance obtained at last of getting a peep at the sun and sky, that your face will beam with corresponding joy and the words will spring to your lips, "You dear, little, brave darling." And that is as it should be. Talk to your flowers when among them, and you will be astonished at the lavish manner in which they will bestow love and sympathy upon you. And at the same time they will remind you if anything is going wrong with them.

The following paper was read by the secretary:

NATIVE PLUMS.

By O. M. Lord, Minnesota City.

The origin of the European plums can only be conjectured. The origin of *Prunus Americana* may be given in the words of "Topsy," "They just growed." The principal use of all kinds is for cooking. Comparatively few are used for dessert purposes. Few persons are aware of the commercial importance of some varieties. For the fiscal year ending last June were imported into the United States from the vicinity of the Mediterranean nearly 65,000,000 pounds of prunes, and the estimated product of California was 1,500,000 lbs. at the wholesale price of four cents per pound, amounting to \$2,500,000. When the probabilities of our native plums are fully realized we shall have no occasion to make such importations. Does this sound visionary? I may ask who would have dared to predict, thirty years ago, the small fruit business, of even one day, of Chicago, Minneapolis or St. Paul. Then, a carload would have supplied the market of either place. Now, thousands of bushels are daily marketed in their season. Fifteen thousand tons of strawberries were received in Chicago last year.

It is true that we have not, at present, a native plum closely corresponding to the foreign prune, but we have them so similar that slight hybridizing will accomplish it; and at the same time extend their culture over a larger area than that of any other perfectly hardy fruit bearing tree. The whole plum family is naturally very nearly allied, and the common wild plum is indigenous in all the soils and adapted to all the climatic variations of the country from east to west, and from the Gulf of Mexico to Lake Winnipeg, and possibly further. The wild parent of the Concord grape did not furnish as promising a basis for hybridizing as do many of the native plums lately brought to notice by cultivation, and some of these naturally compare favorably with European varieties. The Green Gage is generally considered as the standard of excellence for dessert, and the Damson for cooking. No native, as yet, claims to reach the quality of the Gage, but for cooking the Damsons have many a rival. The most serious obstacle to the general cultivation of plums is supposed to be the curculio. Advantage has sometimes been taken of this prevalent belief in advertising new kinds as curculio

proof. It is doubtful if any kind of plum is wholly exempt, but it is well known that the natives are not nearly so liable to be entirely destroyed as the kinds commonly cultivated. In cultivating the natives it has been found that by closely following their natural habits of growth, the depredations of curculio are in a great measure avoided and in many cases entirely obviated, where fruit is produced in great abundance when growing wild. The trees are found in groups growing closely together, and often forming a dense, shady thicket. Indeed it is a rare thing to see an isolated plum tree bearing much fruit. Failure has often resulted, where the trees have been planted too far apart, not only from curculio but from want of fertilization. The tree sheds its pollen very quickly and a high wind or cold rain during the process, entirely prevents the formation of fruit.

When different varieties, that do not shed all their pollen at the same time, are planted closely together and properly cared for by cultivation, an abundance of fruit is reasonably certain. Failure to get good fruit often occurs from an indiscriminate selection of trees for planting. The form or appearance of a tree is no index to the character of its fruit. Where trees are to be taken from the woods, they should be carefully selected for the quality of the fruit. Though the general character of the fruit is quite similar, it is rare to find two separate groups bearing precisely the same quality; the very best, in some cases, within a few rods of the very poor.

The opinion is prevalent that even poor fruit is materially improved by transplanting and cultivating the trees. The fruit may be increased in size, and the texture will be coarser, but the quality will remain the same. In what manner or to what degree the fruit may be influenced by foreign fertilization, is not well known. The seed, however, will always exhibit marked changes.

A recent writer on this subject, says: "When fertilization is imperfect, the fruit degenerates, or forms in irregular shaped bladder-like pods. The probability is, that if fertilization fails no semblance of fruit is formed. These false plums are caused by excessive cold after the fruit is set. If a frost occurs soon after the plums are set, the seed or germ may be destroyed, yet sufficient vitality left to continue an abnormal growth of the covering or outside." No scientific efforts have yet been long enough continued to demonstrate, with what varieties to hybridize, or even how to cultivate to secure the best results.

The Iowa Agricultural College, under Prof. Budd, has accomplished more than any other public institution. The experiments there appear to have been directed in selecting from all parts of the country such varieties as give the best promise, and carefully observing their comparative habits of growth, qualities of fruit and their adaptability to general cultivation.

One of the practical results is the conclusion that no better varieties are known than some that are found growing wild along the Mississippi River in Wisconsin and Minnesota, and along the Missouri in Iowa. The Northern Iowa Horticultural Society, however, recommend one or two Chickasaws. The Miner is the only one that has been planted to any extent further north, but its lateness and irregular habit of bearing will not allow it to be compared favorably with some of the northern kinds. Several other Chickasaws, that succeed further south, have been tried here, but are short lived. Among those that have attracted unusual attention are the Mariana, the Robinson, the Neuman, and from several quite extensive experiments in cropping the northern plum with the Chickasaws. No marked satisfactory new kinds have been brought to general notice. Mr. J. B. Rogers suggests that the best results may be expected from cropping the different varieties of the same family of northern kinds and not attempting to do so with the Europeans.

If one can afford to wait, a good way to raise this desirable fruit is to plant the seed of the kind desired. If the seed is from a natural tree, and isolated, the fruit will be like the parent. Trees of some varieties will begin to bear at three or four years of age.

For successful grafting the work must be done as soon as the frost is out of the ground in the spring, sometimes a short delay will prove disastrous. Quite large trees may be transplanted without injury, if the top is well cut back. Sprouts from the roots will invariably produce the same kind of fruit as the parent. The largest, finest, best fruit will be produced where the ground is naturally rich or well cultivated. In regard to varieties, it is possible that just as good may be found growing wild as any that are yet brought to notice, but several kinds have been so thoroughly tested as to bearing, character of tree, and habits of growth, etc., that it is desirable to select from them rather than risk those that have not been tried. Whatever the soil or location, any one would be safe to plant the kinds recommended by the State Horticultural Society, bearing in mind that

if for market, selections must be made from such as are large, showy, firm in texture, and fair in quality. If for dessert use at home, quality only may be considered. For cooking and preserving, those in which the skin disappears give the most satisfaction.

* A recent writer, one who has experimented largely with native plums, and who is as well informed as anybody in regard to them, says, he has received the finest varieties with which he is acquainted, from the woods of Northern Wisconsin. Prof. Budd says we have some that greatly resemble the best European varieties. Several varieties have been recommended by the Northern horticultural societies, so that the most fastidious need not go amiss in selecting this desirable fruit.

Mr. Sias, from the Committee on Nomenclature, presented the following report:

REPORT OF COMMITTEE ON NOMENCLATURE.

Mr. President:

Your committee on Nomenclature, in accordance with the recommendations of the late lamented Marshall P. Wilder, whose opinions, aye, whose whole life work, will ever be held in sacred veneration by all true pomologists, would say that we fully appreciate his counsel, when he says: "Let us have no more long, unpronounceable, irrelevant, high-flown, bombastic names to our fruits. * * * The cases are very few where a single word will not form a better name for a fruit than two or more." A member of your committee pleads guilty to the charge of naming the Giant Swaar, and would like to see it changed to a name consisting of a single word. Having the right, from the originator, to name this choice fruit, would like to transfer the same to the Society; but, in honor of the originator, who was born in the great city of Paris, will suggest the name of Soiree.

Respectfully submitted,

A. W. SIAS,

A. W. LATHAM.

Prof. Maginnis, from the committee on awards of premiums presented the following report, which was, on motion, adopted:

* D. B. Wier, Lacon, Ill,

AWARDS OF PREMIUMS.

The committee on premiums and awards submit the following report. We have examined all articles on exhibition, and awarded premiums as per premium list:

APPLES.

	Premium.	Amount.
Display Wealthy, Sidney Corp, Hammond.....	First.	\$3 00
Display Wealthy, F. G. Gould, Excelsior.....	Second.	2 00
Display Wealthy, A. W. Latham, Excelsior.....	Third.	1 00
Winter Apples, A. W. Latham, Excelsior.....	First.	2 00
Winter Apples, F. G. Gould, Excelsior.....	Second.	1 00
Collection Hybrids, Whitney, D. Day, Farmington	First.	5 00
Best plate Hybrids, Whitney, N. J. Stubbs, Long Lake.....	First.	2 00
Best plate Hybrids, Meader's Winner, Sidney Corp.....	Second.	1 00

GRAPES.

Display Grapes, A. W. Latham, Excelsior.....	First.	\$5 00
Best plate, Rogers No. 15, A. W. Latham, Excelsior.....	First.	3 00
Display fruit in jars, Wm. Lyons, Minneapolis.....	First.	5 00

CUT FLOWERS.

Floral Design, R. J. Mendenhall, Minneapolis.....	First.	\$5 00
Collection roses, R. J. Mendenhall, Minneapolis.....	First.	3 00
Hand bouquet, R. J. Mendenhall, Minneapolis.....	First.	3 00

VEGETABLES.

Potatoes, Early Ohio, Wm. Lyons, Minneapolis	First.	2 00
Potatoes, Beauty Hebron, N. J. Stubbs, Long Lake.....	Second.	1 00
Potatoes, Great American, Wm. Lyons, Minneapolis.....	First.	2 00
Potatoes, Burbank Seedling, H. F. Busse, Minneapolis.....	Second.	1 00
Onions, Wm. Lyons, Minneapolis.....	First.	2 00
Onions, Red Wethersfield, H. F. Busse, Minneapolis.....	Second.	1 00
Hubbard Squash, H. F. Busse, Minneapolis.....	First.	1 00

SEEDS.

Display seeds, H. Webster, Lake City	First.	5 00
--	--------	------

PANTRY STORES.

Display canned fruit, W. L. Parker, Farmington	First.	3 00
Display canned fruit, Wm. Lyons, Minneapolis	Second.	2 00
Display jellies, W. H. Brimhall, St. Paul.....	First.	2 00
Display jellies, Wm. Lyons, Minneapolis	Second.	1 00
Jar mixed pickles, W. L. Parker, Farmington.....	First.	1 00
Jar mixed pickles, W. H. Brimhall, St. Paul.....	Second.	50
Home-made vinegar, crab-apple, L. E. Day, Farmington ...	First.	1 00
Home-made vinegar, Wm. Lyons, Minneapolis.....	Second.	50
Comb honey, L. E. Day, Farmington.....	First.	1 00
Strained honey, L. E. Day, Farmington	First.	1 00

WORKS OF ART.

Fruit painting, Miss Mary Grimes, Minneapolis.....	First.	3 00
Fruit painting, Miss Ella Grimes, Minneapolis.....	Second.	2 00

We recommend first premium on seedling of Wealthy, G. S. Woolsey, Minneapolis, three dollars; also first premium on McMahon White, Sidney Corp, Hammond, two dollars.

REMARKS.

We found upon exhibition some improved varieties of Dent corn, produced by hybridizing, by J. C. Kramer, which bears the appearance of being a very superior variety, and is spoken of as being early and very productive.

When we consider the peculiarly unfavorable character of the past season, the display was creditable in the highest degree. The bulk of the fruit display was made up of the Wealthy apple, in fine condition, which indicates that the Wealthy, a seedling produced in this State, is still a leading variety for winter use. Besides the seedling varieties entered for premiums, there were four other seedling varieties on exhibition. The one named "Peerless," exhibited by O. F. Brand, we consider, from its appearance and history, to be the best of all seedlings exhibited. One named by Peter M. Gideon is of very superior quality, and gives evidence of being a valuable variety.

Another by Jacob Klein, of Houston County, is of excellent quality and has the appearance of being a much longer keeper than the others. There was one plate of very long-keeping seedlings shown from Massachusetts, by Wm. McIntosh, Langdon, that is evidently a long keeper and an apple of fine appearance.

The exhibition of apple tree woods, by A. G. Tuttle, of Baraboo, Wis., is an interesting feature of the exhibit. He shows sections of twenty-five varieties of Russians and a number of varieties of Ironclads which, in a comparison of the woods, shows about twelve varieties of Russians to be hardier than the Duchess of Oldenburg or any American varieties.

Two cases of insects, by the entomologist, were an important addition to the exhibit.

[Signed]

D. R. MAGINNIS, Chairman.
JOHN S. HARRIS,
C. L. SMITH,
Committee.

REPORT OF SUPERINTENDENT OF EXHIBITS.

ST. PAUL, Jan. 21, 1887.

The exhibit was good considering the cold weather. There were on exhibition fifty-six plates of apples, including some seedlings of much merit, one by O. F. Brand, of Faribault, and one by George S. Woolsey, of Minneapolis. •

Seventeen plates of grapes were exhibited. There was also a fine display of canned fruits and jellies.

Mr. H. Webster, of Lake City, had on exhibition eighty-nine varieties of home-grown garden seeds. Densmore Bros., of Redwing, showed a model of sugar evaporater. Mr. Seth H. Kenny, of Morristown, exhibited samples of sugar and syrup made from amber cane. R. J. Mendenhall, of Minneapolis, had a fine showing of roses and cut flowers.

WM. H. BRIMHALL.

The meeting adjourned till 2 o'clock P. M.

AFTERNOON SESSION.

FRIDAY, Jan. 21, 1887.

The meeting was called to order at 2 o'clock P. M., by President Elliot. The following communications and papers were read:

FROM CANADA.

GRANTON P. O., ONT., Jan. 17, 1887.

My Dear Mr. Hillman:

I should have acknowledged the receipt of your proceedings of your annual meeting before this, but for being laid up with a severe cold. I had no inclination to attend to any correspondence, nor indeed to-day am I hardly able to collect my thoughts.

At any rate, I hope you will have a grand and profitable meeting. I would like you would bring the Jessie up at your meeting and let it have all the prominence possible. It is one of the best berries ever offered to the public.

When I am able to be out to get one of your bills I will send it to you for a membership in your Horticultural Society. Please give my compliments to J. S. Harris, and for yourself every happiness here and hereafter.

Yours, etc.,

JOHN LITTLE.

FROM MANITOBA.

STONEWALL, Jan. 17, 1887.

S. D. Hillman, Secretary, etc.:

It would have afforded me intense pleasure to be present at your meeting to-morrow and succeeding days to listen to the interesting discussions which your comprehensive program must call forth. Although an unasked correspondence may seem like presumption, I venture to write in the hope that through you the following *cranky* notions may have an airing at your annual gathering.

WILD FRUITS OF MANITOBA.

Blue, red, green and yellow plums, wild grapes, red cherry, choke cherry, sand cherry (a low dwarf about eighteen inches to two feet), red and black raspberries, gooseberry and black currants. Cultivated fruits—Turner, Hansel and blackcap (without protection) raspberries; Houghton and Downing gooseberries; red and white Dutch Cherry; Black Naples and other currants; and strawberries of many varieties, including "Manitoba Wonder." W. B. Hall, of Hendingly, has also, I believe, succeeded in raising several varieties of crabs, and out of quite a number planted some fifteen years ago, two Wealthy apples now survive. Other persons have tried apples, but having, as I contend, imported from southern nurseries unsuitable varieties, and perhaps been the victims of unscrupulous tree humbugs, have not succeeded in keeping trees alive beyond the third year.

I have not yet tested anything beyond raspberries, gooseberries and currants, but am now all aglow with zealous eagerness to test fruit growing north of your northern borders, for the following reasons:

1. If the orchardists of Minnesota have partially succeeded, the difference in climate is not so great but we may have a chance of success.

2. The Russian varieties give promise of hardiness, some of same not being perfect in leaf, etc., in Iowa, and Prof. Budd reporting that such will do in the "*far North*."

3. Trees that have died here in the third year have invariably done so from the top. Might this not have been from imperfect circulation of sap, the stem and part of the roots being thawed out and top roots in frozen ground? Would a flat stone

in the subsoil under the tree not cause roots to spread and ensure perfect circulation? Would leaning trees to southwest shade sufficiently to prevent too early thawing out? What is best method of protection in this climate?

4. Would not top-grafting on *hardy* seedlings be most likely to succeed? An old orchardist once told me that the north side of a tree is closer grained—that grafting should invariably be done by working scion right side before, that is north side scion to north side stock. Whether there be any truth in this theory I know not. This I know, “old orchardist” was very successful. Hoping my rambling communication may be found worthy of a hearing, I remain,

Yours, etc.,

THOS. FRANKLAND.

MILBURN, N. J., Dec. 31, 1886.

S. D. Hillman, Secretary, etc.:

Inclosed please find article on “Grape Growing for Farmers.” This is the last work in horticulture I shall do in 1886. Hope it will meet your approval. My best wishes for a successful meeting for your Society.

Wishing you a happy New Year, I remain,

Yours truly,

J. B. ROGERS.

GRAPE GROWING FOR FARMERS.

By J. B. Rogers, Milburn, N. J.

Mr. President and Members of the Minnesota State Horticultural Society:

Last fall your Secretary wrote me, asking for a paper giving plain directions for grape growing. Before complying, in thinking over what subject I should select in compliance with such request, the one at the heading of this paper came to mind, and meeting with the approval of your Secretary, I will endeavor to pen a few words, hoping thereby to induce the farmers of Minnesota to plant grape vines.

That the farmers of Minnesota can grow grapes of a superior quality is an established fact. Why they do not grow them may be a disputed question. Let us examine into some of these disputed points.

First — What varieties of the grape can the farmers of Minne-

sota plant with a reasonable expectation of success? The varieties to be planted must be confined to those known as early, and even then two divisions should be made. In localities having a short growing season, that is, sections in which late frosts in the spring and early frosts in the fall are liable to occur, plant the Lady, Janesville and Moore's Early. The Lady is a pure Concord seedling, having almost the vigor of its parent; early in ripening, of good quality, greenish white in color, and especially valuable in locations subject to late frosts in the spring, owing to its buds being very late in starting, thereby often escaping the loss of a crop. The Janesville is a very hardy, vigorous black grape; prolific, and of poor quality. It begins to color some time before it is ripe, and when fully ripe is as late as the Moore's Early in some localities (that is, one to two weeks before the Concord), yet, when viewed from the farmer's standpoint, the Janesville for the beginner is safer when success is looked for than the Moore's Early. The Moore's Early is said to ripen from one to two weeks before the Concord, but experience proves that like its parent, the Concord, it is very unreliable as to earliness in ripening. Soil and location often renders it as late as the Concord, and in such instances it would be too late for sections where the Janesville would mature. Farmers should plant both the Janesville and Moore's Early, and if the latter variety succeeds and ripens well, discard by taking out by the roots the Janesville. The Moore's Early is a hardy black grape, of excellent quality; generally lacking in vigor the first two or three years after planting, but when once established grows very vigorously. In sections of the State where the seasons between frosts is longer the list of varieties can be extended by the addition of the Delaware and Worden. The Delaware is a small red grape of the very best quality, and too well known to need further description. The Worden is from Concord seed, and may be said to be an improved Concord, ripening a few days earlier than its parent (less than a week), and is fast superseding the Concord for home use or near market. No farmer needs to plant both, and as the Worden is the better of the two, I have omitted the Concord from the list.

Second—What age should vines be when planted to succeed the best?

They should not be over two years old. Those generally selected are either extra one year or extra two years old. An extra one year vine is one that has made eighteen inches or more

of cane growth and has been selected for its superior root growth. An extra two year old is selected with special reference to its superior root growth. An extra vine will cost a few cents more than an ordinary one, yet in the end may result in making grape-growing a success instead of a failure. Purchase your vines from a reliable nurseryman near your home, and deal direct with the principal and never with an agent unless you are certain that the agent has full power to bind the nurseryman he pretends to represent.

Third—Number of varieties and number of vines of each variety to plant. Prudence would dictate the planting of each of the five varieties named herein: Lady, Janesville, Moore's Early, Delaware and Worden, and should a selection have to be made from these, take them in the order in which they are given, and at least three vines of each variety should be set, as long experience has taught grape-growers that it requires three vines of a variety to ascertain with certainty the value of any variety in a given soil. I have given a list of varieties and have arranged them in the order in which, were I going to plant vines on a farm in Minnesota, I should expect the best results from, taking into consideration all the merits and defects of the several varieties named in regard to vigor, plant growth, time of blooming, maturing of the fruit, etc., and from the five varieties named should expect at least three to succeed well.

Fourth—Planting the vines. This point I respectfully refer to the Minnesota State Horticultural Society to fill out.

Fifth—Care of the vines after planting. Mulch the ground for some distance around the vine and allow all the top to grow the first year. In the fall, after the leaves are all killed by the frost, prune the vine to a single stem or cane, leaving three eyes above the ground, and cut the same about an inch above the third eye, as cutting the cane too near the eye may cause the last eye to die from the drying out of end of the cut cane. When winter sets in cover the cane as left with dirt, and this closes the work of the first year. It is not necessary to stake the vines the first year they are set, but early the second year they should have a support.

The length of this paper admonishes me that although much more might be said yet, it must be deferred, and as I see from your programme this is to be followed by pruning and training of the grape, I leave all that to Mr. Pearce.

Farmers of Minnesota, if this paper should incite you to plant

the grape that you may eat of the fruit thereof, I shall feel well repaid for the time spent in writing the same. There is no reason why you should not raise all the grapes you need for your own use. Will you try? As I am writing this the sun is sinking in the west for the last time for the year 1886. To-morrow will usher in the year 1887. How many homesteads in the great Northwest will have grapes growing on them at the close of 1887 no one can tell, yet one thing is certain, if they are not planted they surely will not grow.

FROM PRESIDENT WILSON, OF IOWA.

ATLANTIC, IOWA, Jan. 14, 1887.

S. D. Hillman, Secretary, etc.:

I inclose you an essay on varieties of grapes for the prairies of the West, in connection with some other hints. The points I wish to make are deep planting, winter protection, and the proper fertilizing of the Rogers grapes. If this meets the approval of yourself and Society you may have it. I wish you a large and profitable meeting. Remember me to your Society.

Yours truly, SILAS WILSON.

BEST VARIETIES OF GRAPES.

By Silas Wilson, Atlantic, Iowa.

This is a subject of the greatest importance, not only to the people of this commonwealth, but to the people of the Northwest generally. It has been but a few years since we had comparatively no grapes for the northwestern prairies. Not until the introduction of the grape for the million, the Concord, by Mr. Bull, of Massachusetts, whose name was made famous thereby. The success of Mr. Bull seemed to create a new enthusiasm in grape growing which has developed for us a long list of good grapes that are well adapted to the prairies.

The only trouble now, in my opinion, is in getting the people to carefully follow the directions of those who have made grape-growing a success. There is no longer any question in my mind about growing an abundant supply of good grapes in every county in Iowa by planting only the hardy varieties that have been tested in this State, of which I will name a few before I close.

The next important step is deep planting, thorough cultivation, careful pruning and winter protection. I am of the opinion that more failures in grape-growing can be attributed to shallow planting and lack of winter protection than any other cause. You cannot injure grape vines nor rob them of their surface roots by deep planting, for they will always throw out surface roots, and these roots are often winter killed. Thus you can readily see the advantage of deep planting for the original roots, which are deep down, will remain uninjured and your vines will start off vigorously in the spring, and in the summer, with good cultivation, they will throw out another supply of surface roots.

The best black grapes in their order named are Worden, Moore's Early, Concord, Cottage, Telegraph, Ives Seedling and Janesville White Grape, Lady, Pocklington, Elvira, Lady Washington and Martha; the most promising new white grape, Empire State.

RED GRAPES.

Agawam, Roger's No. 15, Salem, Roger's No. 22 or 53, and Dracont Amber. In new red grapes the Woodruff Red.

Prof. Budd speaks in the most flattering terms of Haskell's Seedling No. 234 as being a valuable red grape.

My recommendation here of Worden and Moore's Early may be critical. I have not done this until after a careful trial of five years in the same vineyard with the same treatment. The Worden is from one week to ten days earlier than the Concord, and will produce from one-third to one-half more fruit of decidedly better flavor. It is as hardy as the Concord.

Moore's Early is a strong, robust grower, not quite so prolific as the Concord, but ten days to two weeks earlier, quality very much like the Concord.

Cottage is a good grape of the Concord type, ripening ten days earlier than the Concord, and is better in quality, but not so prolific as the Worden.

Telegraph has been underestimated. It should be planted in every collection. The vine is very vigorous, with large, dark foliage, very productive, large, compact clusters, ripens a few days later than Moore's Early.

Ives Seedling is one of the strongest growing varieties of the *Labrusca* family; productive, early fruit, in quality only fair; the strongest rooting variety known. Hence it makes the best root on which to graft the more delicate growers.

Of white grapes the Lady is perhaps the best, its only fault being a delicate grower. It needs fertilizing and good cultivation to get the best results.

Pocklington, a good white grape, has not been overestimated, only in its season of ripening. It is no earlier than the Concord.

Elvira is a good grape. If it was ten days earlier it would be a treasure for the Northwest. However, I regard it as the king white grape for the southern districts in Iowa. It is the hardiest grape I ever saw.

Martha, or White Concord, is a good grape; three or four days earlier than Concord, but succeeds well with winter protection.

Lady Washington.—This beautiful white grape has been overlooked. It is a success in the south half of Iowa with winter protection. A vigorous grower, with good foliage, almost equal to Ives' Seedling in vigor. A grape of high quality.

RED GRAPES.

Agawam and Salem are the best. Both should be planted close to Worden or Concord, as they are deficient in pollen and will not fertilize themselves. This is an important feature in growing Rogers' hybrids, for they all have the same characteristic. Wilder, Rogers' No. 4, will perhaps succeed better than any other of the Rogers without fertilization.

Dracut Amber is a very vigorous red or amber colored grape; very hardy, with good foliage; considered by many of rather poor quality.

Woodruff Red is a very large, showy grape, with Concord wood and leaf—very promising.

It is interesting to note that all our very valuable grapes for the North are from either the "Labrusca" or "Riparia" families. Hence I have no faith in any varieties not akin to the above. You will notice that the Worden, Moore's Early, Cottage, Lady, Pocklington and Martha are all seedlings of the Concord. In conclusion, let me impress upon your minds the importance of deep planting, winter protection and fertilizing the Rogers.

DISCUSSION.

Mr. Pearce. I would like to discuss the subject of grape growing briefly, although our time is limited. Mr. Rogers is an excellent authority on grape culture and a man whom I estimate very highly. It is probable that the soil in New Jersey is some-

what different from ours in the matter of ripening grapes. The experience of others here will perhaps bear me out in saying that there is fully two weeks' difference in time of ripening of grapes. A point in regard to Janesville; it colors its fruit very early and a long time before it is fully ripe. It is very sour and foxy; I dislike the quality. It answers very well for jam; in other words it is better than none. The vine is hardy and prolific; needs little protection; earlier than Concord but fully as late when fit to eat.

Mr. Cutler. I would like to inquire about the Lady?

Mr. C. L. Smith. That is very nice; Prof. Porter can tell us about that variety.

Prof. Porter. I have made a pretty full report on grapes and perhaps the shortest method of getting my opinion is to read my report.

Mr. Stubbs. In relation to Janesville would say I consider it a pretty fair grape on account of its prolific habits, especially with those not accustomed to raising grapes. Its quality is against it. Have known it to sell for more in market than Delaware because of its earliness.

Prof. Porter. Moore's Early is a variety I would recommend for cultivation; it is of good quality and will ripen where anything else of the grape kind will ripen in our State.

Mr. C. L. Smith. I think Moore's Early is the best variety we have.

Mr. Harris inquired if the Martha was earlier than Concord at Excelsior.

Mr. Gould. On my place it is not quite as early.

Prof. Porter. Martha has proven the most productive of all the white grapes in our list; color light green, bunches medium in size; compact; it has a tough skin; not as sweet as Delaware, but better than Pocklington.

Mr. Gould. Brighton is one of the strongest growers and will make one-half more weight than Concord under the same treatment.

Prof. Porter. I consider the Brighton for all purposes the best variety in our vineyard. It is one we can grow in this latitude and ripen, and it would be safe for planting in this State generally, and should be planted extensively. It is a prolific bearer, although there is a claim made in certain sections of the country that it is a shy bearer; it was not so with us.

Mr. Gould. It is my experience that it is a poor bearer, and

it may be owing to the character of the soil, but it is an excellent grape.

Prof. Porter. Mr. Gould has mentioned one point that should be kept in view. Of course "two swallows don't make a summer," but it should be remembered that certain varieties are better adapted than others for certain kinds of soil and exposures; and yet we often find different soils in the same vineyard. That is the case with ours; it is on an eastern slope from the bluff; the upper part is almost a drifting sand and varying from that to excellent soil. A portion is a rich prairie loam, although there is more clay than we usually find. My varieties run up and down the slope so the same variety is tested on the different kinds of soil. I make my report from the average product,—not the best nor the worst. We want to lengthen, if possible, both ends of our season. For protection we cover the canes with earth, leaving them on or under ground, where they remain till spring, till all danger has passed from frost. Care should be exercised with regard to uncovering the vines in the spring, not to do it at an unseasonable time; but you may hit it right one year and miss it another.

Mr. D. Day. In regard to the Worden I would say, I was rather lazy last spring and I did not uncover my vines as early as usual, and my brother took his up first. The result was his vines came out with a vigorous growth and produced a bountiful crop while mine did not succeed well.

Mr. Wm. Lyons, from the Committee on Vegetables presented a report on vegetables and small fruits.

REPORT OF COMMITTEE ON VEGETABLES.

By Wm. Lyons, Minneapolis.

Mr. President and Members of the Horticultural Society:

When our worthy president placed me on the vegetable committee he chose the wrong man. I don't feel competent to fill the position and give you a satisfactory report on vegetable gardening. I am more of a worker than a writer or talker, but it is always better to do something than nothing. I will try and give you a short report.

The past season, in many respects was more favorable to the market gardeners than the one preceding. When spring opened it was warm and rainy, all kinds of vegetables grew

rapidly. About the first of May a hard frost cut off some tender vegetables, such as tomatoes, asparagus, potatoes, etc., causing quite a loss to some gardeners. But in my opinion the loss was not near so great as that caused by the cut-worms. The previous season asparagus was good and brought a fair price.

Beans and peas were good. The crop was not large, but prices ruled higher than formerly. Early cabbage and cauliflower did well, late was almost a failure, owing to the ravages of the cabbage butter fly. Celery but few try to raise, and still fewer make a success of it. Our market is supplied mostly from Michigan. This is a subject that needs more light.

Melons this season were particularly good. The crop was large and brought paying prices, consequently melon-raisers were happy.

Onions were a fair crop, but suffered from drought in some locations; brought a fair price. On the whole, I think the crop was satisfactory to the grower.

POTATOES.

More attention is paid to this crop than formerly, and deservedly so, for it is one of the most important crops that we can raise near large cities. Many of the gardeners near Minneapolis plant from ten to forty acres each, and nearly always find ready sale at paying prices. Varieties planted early gave the best returns, while the late planting suffered more or less from drought. On the whole I think there was a good average crop. For early I recommend Early Ohio, Clarke's No. 1, Pearl of Savoy, and Beauty of Hebron; for late, White Elephant, White Star, Burbank, and Empire State. These are the kinds I have found the most reliable and profitable to grow, for market or home use. The Colorado beetle was more numerous than for a number of years, but a few doses of Paris green finished them.

SMALL FRUIT.

The year 1886 to the horticulturist was not a profitable one in many sections, particularly with small fruits. Strawberries were lower in price than ever before known in our market. For several days the price was from three to four cents a box. The old reliable and productive Countess is the variety that overstocks the market. I have over twenty varieties of strawberries growing, mostly in small quantities, merely to test their relative

value. I buy the new varieties and keep them for two years. They receive but ordinary cultivation in the matted row.

The most profitable varieties the past season were Countess, Crescent, Windsor Chief and James Vick; total failure, Cornelia, Mrs. Garfield and Henderson; further trial, Jewel, Emerald and May King. I have a large lot of seedling strawberries growing, one of which, in my opinion, is going to be valuable.

Raspberries—Philadelphia, Turner and Cuthbert are the kinds mostly grown for the market. Turner is the earliest, hardest and best in quality. Philadelphia gives a larger crop of good berries, but they are not so salable. Cuthbert is valuable, but must have winter protection. Marlboro having fruited with me but one year, I don't know much about it; the berry is firm, very large, color bright red; if it proves productive it will be a very valuable market variety. The birds took them in preference to all others. Reliance is large and better in quality than Philadelphia. The Caroline gives good satisfaction; hardy, healthy and productive; too soft to ship. But very few black-caps are grown in my neighborhood, neither soil nor climate seems to agree with them. I have a few hills of Nemaha which gave a fair crop of good sized berries and of good quality. I have a lot of seedling raspberries growing; if any of them proves to be of value I will report to this Society at some future meeting.

Of blackberries the Ancient Briton proves to be the hardest and most prolific for this climate. When the people learn how to grow it and take care of it I think it will be extensively grown for market.

DISCUSSION.

Mr. Allen. This is a subject I have been waiting for. It is one in which I am greatly interested, and I have been anxious to hear from the gardeners. I am handier with the hoe than with the pen, but it seems to me there are some things to be said on this subject, for when we look over this vegetable industry it certainly comes in connection with the horticultural, and should receive its proper share of attention.

DECAYED VEGETABLES.

I want to mention one matter that it seems to me ought to be changed, in some manner, if possible. If you visit these cities in June or July, you may often find in the market tons and car loads of decaying vegetables, that are certainly unwholesome

and which should not be put upon the market, although they are fairly flooded at times with this kind of food. I have seen boxes piled up ten or fifteen feet high that had been shipped in from a distance, filled with provisions in a decaying and rotten condition. This stuff is shipped here, of course, to be sold, and the freight or expressage must be obtained in some way. The commission men don't want to lose it, and the result is the article, whatever it may be, is pushed upon the market.

Now, I have no objections to their shipping their vegetables here from the South, provided it is wholesome and good. But the shipping of such quantities of it here sometimes has a tendency to hurt our markets. It has that effect with us.

When these early vegetables and green fruits are shipped here from a distance, in the spring, many persons will hanker for the green trash. Very often it makes them sick to eat it and they don't recover their usual health for weeks afterwards perhaps.

It seems to me that we might remedy this evil in part at least, and if we can we ought to do it. We make a practice of shipping a good deal to these markets from Red Wing, and we try to place it on the market just as early as we possibly can. Beets and turnips are easily transplanted. We have grown and placed on the market nice beets by the first week in June, also early potatoes, which we have shipped to and sold readily on the Minneapolis market.

BEETS AND TURNIPS.

If you set out beets too early they are apt to run to seed. We usually set them about the middle of March. We plant them in shallow boxes by the thousand and transplant. We find it of great advantage to do this. We have the soil well prepared and find they will stand quite a hard frost. It is well to take them out into the open air and expose them as much as possible to harden them up before transplanting them. In this way we raise beautiful beets. We can do the same with turnips.

TOMATOES.

Of course my time is limited, but I would like to say a word on the subject of tomatoes. It seems to me they are the next to fruit in importance and value. They come in just after the small fruit is passing away, and we have obtained big prices for them. Have sold the first tomatoes as high as five cents apiece.

for the first of the season. We have sold them in Minneapolis at three dollars a bushel as fast as we could get them to market. After the market is once supplied, of course the prices decline rapidly. But we calculate our first pickings will pay us well for the whole crop.

I have tried various plans for securing my stock of tomato plants. Have bought them in New York, in Illinois, in this State, and I have never had as good success with plants obtained elsewhere as with those I grow myself. I will give you my method if you desire to know how I raise tomato plants. I use the Canada Vick; it does not grow to vines; the vine is small, and the tomatoes mature early. Acme is our next best in market. I plant the seed by the first of March in my hot house, planting Canadas first. In a week or so I plant Acme. When they show the third or fourth leaf I transplant and remove to a cooler place. Plan to get good-sized plants, transplanting into deeper boxes and hold them in my hot house until about the middle of April, when I put them out. We have our pile of compost and manage to control them very well by setting them about the fifteenth of April. Have found tomatoes a profitable crop.

The following paper was placed on file for publication:

LAWS GOVERNING THE HARDINESS OF PLANTS.

By J. O. Barrett, Browns Valley, Traverse County.

Every observing and experienced horticulturist reports something different from all the rest, sometimes contradictory, and yet is right from his standpoint. Special environment involves special phenomena with facts corresponding. But who absolutely knows? After we have compared notes and summed up the testimony as to the hardiness of such and such plants, we query still, and remain humble pupils amid nature's interminable mysteries. To dogmatize in horticulture is an unpardonable presumption. Better lay our ears close to our plants, and listen to what they have to say. If I can suggest something worthy of investigation, it is enough.

We know that tropical plants, like animals, can not be immediately transported into our latitude and live. It must first be graduated by slow and careful methods. After successive years of patient trial under the law of the transmission of qualities,

they may become acclimated. It is not too much of prophetic hopefulness to say that, in due time, what are now considered non-hardy here, but hardy enough for the South, will be iron-clads with our best. If we faithfully pave the way, generations to come will grow all over the Northwest the Baldwin, the Spitzbergin, the Greening and the like, with greater facility than we now grow the Wealthy, the Duchess, and the Russians.

There is no certainty that a highly perfected variety, whether plant or animal, will retain its original points when transplanted beyond its native environment. Hardy in Russia may not always be hardy with us, as experimentation proves. There are local influences everywhere at work that elude the grasp of the stethoscope or the thermometer. Evidently every plant, and animal as well, contains, germinally, the constituency and impress of its origin, of its species, of its variety, of its complex relations, through all the ages of its evolution. If this be so, it requires but a special environment to call out a corresponding force or quality. But here we are lost in mystery again. We are unable by any art or analysis to determine how a special tinge inheres with the germ in the seed; how plants are locally zoned; how the shadow of one tree upon another may strengthen or weaken it; how an underground pebble, shaping a fibrous root, may feed or famish the stalk; how the rustling touch of a neighborly leaf may divide the sunshine, depleting power of endurance; how the thermal reflection of a sheltering rock or sod, the kiss of a dewdrop or zephyr in the stilly evening, may give texture and mould to a plant, imperceptibly defining whether it belongs to the torrid, the temperate, or the frigid classification—hardy to live or non-hardy to die, when transplanted to stand alone.

As best we can let us look a moment within the circle of environment. Scientists have demonstrated that living things are in constant, tremulous motion; that whenever two bodies are synchronous, or in concord relative to each other, there is a manifestation of force or growth in new form. To account for phenomena they accept the ancient hypothesis of an ether, which, as Prof. Tyndall presents it, "conveys the pulses of light and heat, not only fills the celestial spaces, bathing the sides of suns and planets, but it also encircles the atoms of which these suns and planets are composed." The atoms are differently keyed in different bodies; hence, their resultant motion is different, as demonstrated by our sensations. Take, for instance, several pieces

of wood from different species of trees of the same size; strike each with a hammer, and we hear different sounds. If we could have an adjustment delicate enough, the same phenomenon would be observable in the same sized blocks clipped from trees of the same species and the same variety, proving no two things are alike in all respects. If we ask for the cause of this, we shall have to content ourselves with the fact, that by some mysterious, molecular structure, some bodies are more sonorous than others, and keyed unlike. So it is relative to the ether-conveyance of heat and cold waves. Some bodies are good radiators, and some are bad radiators; that is, some are so constituted and keyed as to communicate their motion freely with strong undulations of the ether that conveys such motion, while other bodies do not so powerfully communicate their wave-action. With a sun-glass focalize a solar beam in the air, not a particle of heat is sensibly evolved; put your hand in the focus, it may draw a blister; put wood in there and it bursts into a flame. Transparent bodies like pure air, or colorless glass, or ice, or snow, are incompetent to absorb luminous rays. A purely luminous beam cannot harm a single specula of an ice crystal. It is not the "shine" but a body of dark rays emitted by the sun, that melts the snows and the glaciers, and quickens slumbering forces into organic form.

As the atmosphere is a poor absorber and radiator of heat, and the ground a good one in this respect, the inference to be drawn from these phenomena, is, that protection to the roots of a plant is of more vital consequence than protection to its stem, as we have experimentally learned. A black body, like our prairie soil, absorbs and radiates heat more powerfully than a lighter colored soil. This scientific fact suggests that the frequent loss of our small fruit plants, such as raspberries and blackberries, dirt-covered for the winter in our prairie country, is due, largely, to the great heat-absorbing and radiating qualities of our black, sticky soil, and that a lighter colored covering or mulching, snow especially, or even sand, such as the Russians apply to their orchards, or old, broken straw is more protective. We have learned by a losing trial, that black tarred paper tied round our fruit trees for the winter, kills more trees than rabbits can; that white envelopes, such as newspapers, are safe every way. The difference is owing, doubtless, to the law in question.

Let us apply these simple discoveries relative to the wave action of things. Here is a clump of apple trees, apparently of the same degree of hardiness, healthful conditions being the

same. Keep in mind the fact that each possesses its own individuality, having an imperceivable constituency peculiar to itself, and locally occupies a different angle from all the rest in respect to its receptive or radiative force under the ethereal action of heat and cold waves. One tree responds, another does not so well respond; in other words, the undulations of the ether conveying the heat or cold waves are synchronous with the one and jarring in the other. Perhaps an analagous illustration will aid us here. Sing into a piano; a certain string responds. Vary the pitch of your voice; the first string is silent, but another answers back. Change again the pitch; the first two cease to vibrate, and a third awakes to melody. As you alter the pitch, you change the form of motion communicated by your voice to the air, which in wave-action trills upon strings that are in accord. If a heavy blow be struck upon the sounding-board, every string will feel it, catching up what molecularly corresponds in pitch, those of higher tension with sharper report, perhaps injuring their sonorous properties. If our data be correct and illustration applicable, it is obvious that it will make no material difference *where* the tree is struck by the calorific waves—unless position gives difference of temperature; but it is certain that all parts of the plant, from atoms to cells, by reflex action are affected; and the hurtful jar will be at the weakest point—in the root, or stem, or twig, or leaf, on the north or south side, or any other side that is vulnerable. As a blow or disease centres in the weakest organ, so any adverse influence lodges where the plant is weakest. It is no matter of surprise, therefore, that our plants, being diversely located and conditioned, are diversely injured by the same force at work. Whatever breaks down the nerve filaments of the human brain, or the cellular tissues of a plant, is sure ruin. Where a weakness obtains through starvation, gluttony, or other debilitating agency, a plant is, of course, the more liable to succumb under the trial of its strength. If one ingredient only is deficient, say carbonic acid, which furnishes mainly all the vegetable material out of which the plant is evolved, or if robbed of its sustenance by a too thick relationship with other plants, but a slight jar may hasten its death. To live in our battling world, a plant, like an animal or a human being, must inherit and acquire healthful tendencies. Calorific waves fall upon it like so many strokes of a hammer, and, if long continued, crumble or weaken its molecular structure. It is to a plant what a "sunstroke" is

to a man. When a magnet is subjected to a white heat it loses its polarity and can never be restored. Right here is a matter upon which our more learned professors should enlighten us — how and to what extent electric forces apply to plants, and what environing conditions will injure or destroy their circulatory polarities.

A critical period is when the sap goes up from the spangleoles for the development of buds and leaves. These not being unfolded enough to educe a balancing exhalation, an excessive solar heat in a dry atmosphere may dam up the flow, overcharging the variform tissue, or circulatory ducts, resulting in a greater ruin than that from the combined forces of an Arctic winter.

Last spring I had occasion to remove some seedling apple trees. To all appearance they were generally in excellent condition, root and branch. In a few days the buds swelled into incipient leaves, and the same promising feature characterized the older trees of the permanent orchard. Of a sudden the heat of a midsummer burst upon us, growing hotter week in and week out. Ere the temperature lowered I noticed signs of wilting; the tender leaves dried up, and soon three-quarters of the old and the new orchard was dead. I detected a sour effluvia in all the dead candidates, indicating that the starch or saccharine properties of the sap fermented in the hot circulation. The few that survived the shock were more or less discolored, "black-hearted," traceable, no doubt, to the same cause. During the prior winter another killing force fell upon the plants in our section. We had no rains to any marked extent from August to March; now and then a shower of snow, soon melting away. The soil was so dry it could not freeze for many weeks, even in December and January. Of course thousands upon thousands of young plants winter-dried up — effect the same as in a summer drought. My first impression was that my apple trees were thus imperceptibly injured, the same as a field of one-year box elders, and probably they were thus weakened, there not being enough of the nutritive salts derived from water held back in the roots for the summer's vegetation. But on closer inspection I had to rank the winter calamity as secondary and not primal, for strawberry, blackberry and other small fruit plants, shipped in a perfect state of health, wilted and died in about the same percentage as the apple trees; after having developed their buds, looking green and promising, they were paralyzed by that

spring's intense heat. Cold and heat — heat and cold — are but relative terms; their molecular action comes under the same law. If the circulation is uniform throughout, irrespective of the general temperature — for circulation obtains, though feeble, in a frozen plant — there is less danger, doubtless, than when a part is clogged up by a freeze or sudden thaw.

In his interesting narrative of his "Voyage of Discovery toward the North Pole," Dr. Hayes, after citing to a like testimony of Dr. Kane, informs us that when the Greenlanders shoot a deer they immediately eviscerate it; otherwise it will soon putrify, even when the temperature is far below zero. His explanation is this: "The animal is immediately frozen on the outside, and there being thus formed a layer of non-conducting ice, as well as the pores being closed, the warmth of the stomach is retained long enough for decomposition to take place, and to generate gas, which permeates the tissues, and renders the flesh unfit for food; and this view of the case would seem to be confirmed by the fact that decomposition occurs more readily in the cold weather of midwinter (in the Arctic regions) than in the warmer weather of midsummer." His explanation appears tenable, and applies to plants as well. Such phenomena lead us to conclude that any great thermal disparity in the cell layers of a plant produce like results, irrespective of the season; that a gradual freeze or thaw is less dangerous than a sudden one; that when the entire plant is solidly frozen up, with the ground holding its roots, it may be safe; that the transition by heat to circulation is the perilous moment, always perilous if any weakness inheres; that the drought of summer or the dry chill of winter acts by the same law, resulting in injury or ruin.

Considering all the adverse circumstances and conditions which we have to encounter and try to avert, it is a wonder that in a climate like ours more of our plants do not prematurely "give up the ghost." But experimentation gives us hope. We know that some plants are adapted to almost any temperamental changes. Why, is yet a mystery. We know not how the entanglement of cohesion affects the hardness of a plant; nor how air or fluid within the circulatory ducts clothes it with resisting power against heat and cold.

A propositional summary of the matter in question is this:

That a plant is safe when competent to respond to the calorific waves in a balanced circulation and development.

That danger ensues when the waves are too quick and intense for the strength of the plant, as in a "sun stroke."

That when, as in a hot spring, the radiation, or better exhalation, is not equal to the absorption, there being more ascending gap than the distributive channels can utilize, a gorging gas ferments in the cells, and decay follows.

That when a plant is so molecularly constituted as to be impervious to the undue action of calorific waves, their motion being intercepted, as though it were clothed with a heat-proof coating, like that of asbestos, it is reliable and entitled to the rank of "ironclad."

Whether these views be deemed correct or not, we are agreed in one thing—at horticultural success hinges largely upon temperamental uniformity. The extremes of heat and cold do not necessarily depend upon latitude or altitude. The maximum and minimum of temperature is greatest where the air is driest. In the far southern plains of India, in Australia, in Central Asia, or wherever drought reigns supreme, there is the intense action of heat and intense reaction of cold. In the Sahara of the torrid zone, the temperature rapidly runs down to freezing when the solar rays cease to infringe upon the burning sands. Where there is little or no vapor overhead to check the calorific drain, these extremes obtain. Being dry, our prairie climate is subject to them; hence the battle we have to fight. There seem to be two ways out of our difficulty—either to continue our long yet hopeful experimentation, acclimatizing a special class of plants, or else undertake the herculean task of changing our climate from a dry condition to one of a more uniform humidity, thus fitting it for the introduction and growth of a greater variety of plants, including cherries and pears, and perhaps peaches.

So long as we have to pet our plants and put dresses on them, while out in the cold, success is precarious and profits thin. In the long ago, when we were school folks in New England, or somewhere near the sea coast, nobody had to fret and stew as we do to make a tree live. It would grow in spite of us. We did not have to blanket the raspberries, and blackberries, and strawberries. They laughed at our neglect and proffered luscious fruits unearned. If we could have such a climate restored, with such a soil as ours and knowledge of plant treatment, would we not have in our adopted country a very paradise? But, you say, we are working in that direction; true, but at a "poor, dying rate." While we are building up, forest vandals are tearing down. The "big woods" of Minnesota that have exerted a

most beneficent influence upon plant growth in the more eastern parts of the State especially, are receding faster than our forests are growing in other directions. And when they are leveled down by the woodman's axe, not only will winds be fiercer in the upper Mississippi valley and the air drier, but your luck here in the fruit line will be more like ours on the now almost treeless prairie, fortuitous as our temperamental vicissitudes. Just beyond the western border of our State, in Dakota, are the Coteaux, a high and long rampart of hills, with innumerable ravines, heretofore thickly studded with forests, down which babble the crystal brooks.

The Sissetons there, who have land charters, follow the example of the pale faces elsewhere, cutting and slashing down the century trees for fuel-sale in our markets, and the prairie fires, set by careless Indians or whites, lap up the rest. Unless the national government soon interferes, prohibiting such vandalism, the now beautiful Minnesota will dry up at its more northern and western sources. There is a similar depredation, and on a more gigantic scale, in Montana, in Colorado and other Rocky Mountain states; if not speedily arrested and forests restored, not only will the facilities of irrigation be literally destroyed, but the more western plains will be transformed into dry and parching deserts. And what is still more alarming, congress intends to put on the finishing stroke by abolishing the timber-culture act, the enforcement of which—granting special abuses, as in everything else—has blessed the prairie country with here and there a growing forest. If there be a personal devil to “hand the wretch to order,” he certainly is busy destroying our forests, for thereby humanity can be most cursed.

As an organized body that knows what it is about, let us storm our legislature, and by it storm Congress, to save our great forests from utter extinction. Let us demand appropriations to change our ravines and basins and lesser lakes and rivers, into a grand reservoir system, holding back the spring surplus waters now running to waste, whence to draw not only navigable depths for commerce, but aqueous refreshment for all the thirsty plains below. Let us demand a law that shall not only encourage by a money consideration, but compel landholders to plant forests, making such planting on timber claim or homestead inhere with title. When this feasible enterprise is put into execution on the vast scale that it merits, there will be less floods, evaporation checked, extremes of heat and cold mitigated, our climate

milder grown. When our rich Northwest is thus mantled over with a protective humidity, a new and more plentiful variety of plants will thrive alongside the old "ironclads" on the farm and garden and nursery, and

"The world will be the better for it."

TREE PEDDLERS.

Mr. Grimes, from the committee on the subject of tree peddlers, presented the following report, which was signed by all the members of the committee:

WHEREAS, Numerous complaints have been made before this Society during its present session that unprincipled tree peddlers have from time to time, and especially during the past year, represented that they were selling Minnesota nursery grown trees and stock from nurseries located in this State, and

WHEREAS, Such representations were entirely false in fact, and upon proof it was found that said nursery stock was propagated and grown in a distant state, far south and east of this, and was wholly unreliable here, and that disappointment and losses have been almost invariably the result from purchasing such trees and plants and that the people of this State have been and still continue to be swindled in open defiance of all honor and fair dealing;

NOW, THEREFORE, We, the Minnesota State Horticultural Society, petition your honorable body, the legislature of the State of Minnesota, to enact such laws for the better protection and well being of its citizens as shall compel all tree agents selling foreign grown trees and plants to take out a license in the county or district in which they intend to sell, such license to be granted only upon the sworn application of such agent stating the facts in the case, and especially by whom employed and where the stock is grown.

Second—Making it unlawful for any such agent to sell without first procuring a license; and upon conviction of making such sale without such license, before any justice of the peace having competent jurisdiction, imposing a fine in any sum not to exceed one hundred dollars, or imprisonment in the discretion of the court.

Third—Making false representations in the sale of nursery stock, in order to deceive the purchaser, and thereby induce him to buy of them, upon such false representations, making it a misdemeanor punishable by fine or imprisonment, or both.

Fourth—Also in making the principal accessory in all transactions where agents are employed by him, and to be held responsible for his acts where fraud has been practiced and sales effected thereby and wherein the purchaser has suffered loss.

Fifth—Nurserymen who reside in the State and are doing

business exclusively in Minnesota nursery grown stock shall not be required to take out such license, but shall in all other respects be subject to the provisions in the preceding sections.

Sixth—Requiring the applicant for license to pay all reasonable fees for the same, and also to give bonds that he will fully comply with the foregoing.

DISCUSSION.

Mr. Dartt. I suppose the report is before the house for discussion. There is one point that strikes me as not being exactly right, and that is where it proposes to hold the principal responsible criminally for the criminal act of his agent. I move the adoption of the report.

Mr. Latham. By this report it seems the object sought to be brought about is to secure legislation to prevent parties from putting upon the farmers of the State, nursery stock grown somewhere else, under the representation that it is grown in some nursery in this State. I don't understand how that object is to be secured. It simply requires a license of the agents, and they will go around and sell as before and will still sell shrubbery trees, etc.

Mr. C. L. Smith. We will be better off in this respect: when the agent attempts to sell foreign grown stock attention will be called to the character of the stock he is selling; and we desire to have it made a criminal offense to represent it as Minnesota stock; if he makes such representations he commits a misdemeanor and is liable to fine and imprisonment for such offense.

Mr. Latham. I don't think people generally will understand that; it seems to me the license itself should be extensively advertised to show where he was from. To make any law efficient, to protect the buyer, it seems to me a bond should be required as is done in the case of an insurance company; a sufficient and satisfactory bond should be deposited with some state official, holding him to accountability for the results of his agency.

President Elliot. That is contemplated.

Mr. Harris. We expect a man will deposit a bond with the secretary of state.

Mr. Dartt. There is a question I was going to raise in regard to an agent selling stock that was partly Minnesota grown and a portion of it, or the bulk of it, grown somewhere else.

Mr. Grimes. It would be just as much of a fraud if it was represented as being all grown in this State.

Mr. Latham. That hits every man in the State; it is absolutely impossible to comply with the requirements; everybody knows that no nurseryman can keep all the stock he advertises; if he cannot buy in Minnesota he has to go to Wisconsin, or Illinois, or somewhere else, for it must be had.

Mr. Cutler. Mr. President, it seems to me the object is to prohibit a man from misrepresenting. Suppose a man who is a nurseryman has an agent on the road; I ask him where the stock he sells is grown; he says part in Minnesota, part in New York; that would be all right, I would buy it knowing what I was buying. But when he says it is wholly grown in Minnesota, according to the provisions of the proposed act he would render himself liable; I don't see any injustice in that at all.

Mr. Latham. Mr. Chairman, I think that ought to be changed; it is impossible for the agent to know where all this stock comes from.

Mr. Cutler. He might countermand his order in such case.

Mr. Latham. An agent can not know where all the stock he sells is grown, whether at Excelsior, at Lake City, or any other particular place, but he has to get his stock somewhere and if he takes an order he will get it filled somewhere. I don't believe there is a delivery made of any amount where the stock is all grown by the party selling.

Mr. Gould. So far I have avoided taking any part in this "controversy," which I will refer to in that way. I have no doubt it is well intended by the parties who have pushed this scheme; but I have been in the nursery business to some extent for sixteen or eighteen years. I am rather out of it now. But I do pretend to know something about the business and the men that are carrying on this business in Minnesota; and I regard this whole business as a sort of boy's play, when we undertake to secure legislation to fit the case; it is impossible to do it. While it is perhaps well enough to agitate the question here—I suppose more or less of it goes into the record—I think it is expecting a little too much to suppose that the legislature will pass any enactment to protect farmers from the ravages of tree peddlers.

Mr. C. E. Smith. Well, they *will* do it.

Mr. Gould. I want to say further, until you can educate the farmers they will be imposed upon. You might as well have the lightning-rod men licensed and with just as much propriety, and these washing-machine men, the dairymen and horsemen and

new cattlemen, and thus go through the whole list of everything they buy. Why, I should think the farmers would resent all this thing. They will buy of a man who will charge them about three or four times what a thing is worth quicker than they will buy of one of us poor fellows, who sell just as low as we can and live, and sell them stock that we raise, and at a much lower price than that brought from a distance. People favor the agents every time who charge high prices. This is no theory of mine; I know what I am talking about, and I am telling the truth. An agent, for instance, tells about what I have got; how it will compare with anything that can be procured elsewhere. They are looking for something better; they want a gooseberry two inches in diameter, as big as a Wealthy apple, and if they can see a nice picture of one, greatly magnified, they are bound to take it. One of these same men who had given an agent of mine an order for three or four dollars' worth of stock and thought it was a pretty large price to pay, gave one of these travelling agents an order of twenty or twenty-five dollars. This man came by my place after that and told me he was fool enough to buy some of their stuff, and I told him I was glad he did so—possibly after he had a little experience he would know who to buy of; I didn't pity him if he was victimized, as he did not seem to wish to favor his neighbors, but expected to get something which it was impossible to obtain.

Now, I don't believe we can accomplish anything in this direction further than the discussion of the subject may develop something that may tend to put those on their guard, who may have an opportunity to read it.

Mr. Pearce. This is a good deal like locking the door after the horse is stolen. It is said that lightning never strikes but once in a place. I would say, let the innocent individual throw the first stone. As a matter of fact I know that trees are imported by our nurserymen; I have done it myself. I buy stuff raised elsewhere, although I never import trees. I think this thing will regulate itself in a short time. Agitate the question and get it before the people. They are not buying much of agents of late. In some places they would almost go for an agent with shot guns and dogs. I think passing a law of this kind would be of no benefit whatever. It would help every nurseryman in the State—I know it would. It would stop the retail business over the country. The best way is to go straight along and do a steady business. That is the true way. It will be a dead let-

ter. It will not be a popular law and will never operate as you think it will, at all. You pass a law requiring a license and it would put a tariff on the stock sold which would come out of the consumer.

Mr. Cutler. Mr. President, I can not see why the gentlemen who are in this business of selling nursery stock can oppose this measure. As Mr. Pearce has stated it is going to help him because it will drive these other fellows out. I believe we have laws for our protection and for the protection of the poor. Mr. Gould's orchard is protected by law from the depredations of thieves; a stringent law has been passed to prevent stealing of fruit. A few years ago a law was passed in regard to patent rights, and have we seen these men running over the country lately as we used to? And now, for the protection of the poor, living out on the prairies, I would like to see such men protected, as well as the nurserymen. They will buy trees when they want them. If I want a dollar's worth of sugar I go to the store and buy it, and I know where to get it. We can get along very well without the help of these sharks that come here from some other state to impose worthless stock upon us.

Mr. C. L. Smith. The saving in one year would be enough to pay the running expenses of our Society since its organization.

Mr. Sias. In regard to one point my friend Pearce made. He says there is no use of locking the stable after the horse is stolen. There are a great many horses in the stable that have not been stolen. It is our duty to protect those animals. Laws are made for the lawless. There is nothing in this measure that can harm an innocent dealer. It is not intended to injure our nurserymen. I can not see anything that would injure my business, or Mr. Gould's, or Mr. Latham's. If you will study it carefully I think you will reach the conclusion that it can not hurt anybody except those who are doing a fraudulent business. It has been shown that these operations complained of have been going on here for years. I have been trying to compete with these fraudulent tree dealers for about twenty-five years. We have tried repeatedly to pass something in this State Horticultural Society, that looked a little as though we didn't believe in such practices. Last year our president, I am sorry to say (and he is an old friend of mine), threw "cold water" on the whole thing. We could not pass a single thing that looked like taking any action in the matter. We have a chairman now who is willing to do something. He is not afraid of these men. He has

told us plainly that he is willing that we should express our sentiments in regard to fraudulent transactions. There will be no difficulty in getting something accomplished in this matter if we look at it in the true and proper light.

Mr. Dartt. So far as the canvassing is concerned I am not much interested in it. I have looked the matter over and I made up my mind that a good, straight, honest man wouldn't be a successful canvasser, and one who was not such I did not wish to trust; so I don't have any canvasser. That is the way it used to be and the same thing still exists; it is almost a necessity for a man who would be a successful canvasser to tell all about the bright side of the story and not say a word on the other side; in other words that he shall misrepresent. Whether this will be the best thing to remedy the evil, I do not know; but I do know that there is danger in asking the legislature for something that you don't want. This is the proper place and time to see and understand where any defect may be, for the presumption is that our representatives in the legislature don't know as much about this as you do. They might pass a law that would be a damage to the best interests of the State, in regard to fruit culture. A few years ago there was a bill before the legislature making it a criminal offense to sell blackhearted trees; I don't know but it came very near passing. If such a law were to be passed I could not sell a tree, for after every severe winter every tree is blackhearted; I think I am safe in saying that every standard apple tree is more or less blackhearted. We should not ask for a thing that is not well considered; we can better trust the Society to say what legislation is needed than to trust to the legislature. It may be that this is just right, and if it is it is just what I want; I want fraud punished.

Mr. Cutler. We have a "farmer" legislature and there will be no difficulty in securing such legislation as is in the interest of farmers.

President Elliot. I see this is going to clash with some of our ideas as to the method of selling trees. Last winter when this subject came up I was very much interested in it and watched the discussion very closely as well as those who took part in it. I see we are selfish beings and we are apt to work for selfish objects. I have taken pains to look over the record a little in regard to tree peddlers. We can go back to 1852 and then back to 1840 and we shall find this same "pestiferous" tree peddler. He started out in Indiana with a bundle of cions; he was top-

working trees and would not only put in cions that were untrue to name, but would take several varieties out of the same bundle. These fraudulent practices have been continued year by year; they have the thing down so fine now that they will take most anyone—I don't care how well he is posted in horticulture—and they will swindle him from the word go!

In order to put a stop to this thing, and the only way in which to reach the thing, it seems to me, is through legislation; and if we can not get our rights through legislation, perhaps the sooner we quit business as a Society the better. When people can come in here and throw out insinuations that unless we do as they say that they will stop our appropriations, why I think it is time for us to move. I have corresponded with parties in other states and find others of the same opinion with myself in regard to this matter. If Dakota, Iowa, Wisconsin and Minnesota will unite to secure legislation in this regard, I think we may get a law that will protect our poor people; our immigrants that are coming in here, those who can not speak the language, who can neither read nor write, those who fall easy victims to the wiles of these irresponsible tree men, those who are an easy prey. I think we have a legislature now that will act in the interest of poor people and the farmer, and the members of that body will gladly help us out. While this proposition, as set forth in the report of the committee, may not be exactly what is desired, the subject can be brought before the proper legislative committee to formulate an act that will be for the best interests of the State at large.

Mr. Dartt. I suppose our committee on legislation will look after the matter.

Mr. Latham. I do not feel fully satisfied with this yet; I think the matter should be well considered before definite action is taken. If the motion is insisted upon I think I shall move to indefinitely postpone action upon it at this time.

Prof. Porter. It strikes me that we are claiming a monopoly in this interest. This discriminates in favor of Minnesota men; this contemplates the passage of a law for the regulation of the transactions of outsiders, but it seems to make no difference as to the character of the operations of the nurserymen of Minnesota.

Mr. Gould. I want to repeat some things I said before. It seems to me this is going to interfere largely with the operations of nurserymen in this State. I am not in the nursery business myself, but don't like to see a foolish thing done. If it was not

for agents there would not be much stock sold. If it had not been for tree agents there wouldn't have been enough trees in the State to build a crow's nest.

A Voice. There isn't now!

Mr. Gould. I believe the only thing to do is to let the thing regulate itself. I don't believe in protecting fraudulent operations — I don't believe in that; I will set my business up beside that of any man in this building or anywhere else; people know what I have been doing. I believe in the tree peddler just as much as in the Methodist preacher. You pass a law that ties this thing too closely and you destroy the business of nearly every nursery. A man must grow everything he sells. He can't always do that, and it is not best that he should; one man can't do everything. When an agent comes around and the people want to buy their stock they have a right to have it.

Mr. Harris. I was raised in Ohio. Some forty years ago that state was overrun with horse thieves. They didn't dare to own a horse worth over forty dollars until they went to work and drove out the horse thieves. After they did that they could raise and keep as good horses in Ohio as in any other country. I do not believe in building up monopolies at the expense of the people, and this proposed measure is intended as a partial check on the monopoly business. These deadbeats get together and organize a corporation and send their agents broadcast over the country, selling the most worthless and miserable stock that can be produced. They have carried on these operations so long and so boldly, robbing farmers of their time and money, that farmers are about discouraged in trying to grow fruit, and those who have been trying to do a legitimate business as nurserymen have also become very thoroughly discouraged. It is time that some action should be taken in this matter.

The report was then adopted.

Mr. Cutler. I wish to call attention to the action taken yesterday by the Society, in passing a resolution in effect requiring the secretary to omit the names of nursery firms from the report of the discussions on this subject. (See page 280.) It seems to me to strike out the name of L. L. May & Co. wherever it occurs in our proceedings; will require the striking out of the whole proceedings in regard to this firm. I believe this resolution was adopted without being properly understood. I did not come down here to spend my time and work for nothing, and I do not suppose the members desire the larger portion of our dis-

cussions on these matters stricken from our records, I therefore would move to reconsider the vote whereby this resolution was adopted.

Mr. Sias. Before this motion is put I wish to say a word. No doubt Prof. Porter, in offering this resolution, did so in good faith. He is a friend of this Society and has admitted here that he knew nothing of this firm of L. L. May & Co., that he never had any business transactions with them. There are others who have had transactions with them and are fully aware of the facts of the case. Had he known all the facts I am satisfied he would not have offered the resolution. I do not suppose the Society understood fully the nature of the action being taken and therefore would be willing to rescind the vote then taken.

The motion of Mr. Cutler was adopted.

Mr. Gould. It seems to me this is going on in a curious way; I should like to have a record of the vote taken so it will be known how we stand in this respect. It has been the custom of our Society to keep out personal matters and I fear we are getting ourselves into trouble. I hardly know how to act in the matter.

Mr. C. L. Smith. Mr. May came in here and requested personally to have an opportunity to be heard; having gotten much the worst of it he was pleased to have someone get up and help him out of it; that is exactly what we did by passing that resolution of Prof. Porter's. I want the discussions had to go on the record as they occurred. I am not ashamed of it at all, and those who are opposed to this can vote against it.

The motion then being upon the adoption of the resolution offered by Prof. Porter the motion was lost.

Mr. Brand offered the following resolution, which was adopted:

Resolved, That a committee of three be appointed by the chair to investigate the extent and quality of pine lands belonging to the State, from which the timber has been cut, their location and the practicability of their protection from fire and improvement by planting, thinning and cultivation, said committee to report at our next annual meeting.

Upon the foregoing resolution the following committee was appointed, *viz*: O. F. Brand, J. W. Boxell, and C. L. Smith.

Mr. Smith was then called upon to address the Society on small fruits.

THE CULTIVATION OF STRAWBERRIES.

By J. M. Smith, Green Bay, Wis.

MR. PRESIDENT: I will try and be as brief as possible, and if I don't make myself understood I hope the members will not hesitate to ask questions and I will try to answer them if I can. I shall aim to talk to you briefly upon what I take to be the needs of farmers.

People in the cities can learn to grow strawberries for themselves, or they can buy them. There is no great secret about growing them. But I shall speak more directly of their culture on the farm. Any man that can grow a crop of corn ought to be able to grow strawberries successfully, and any man who will grow a good crop of potatoes will grow a fair crop of strawberries, providing the conditions are right. The question is, how will you do it?

METHOD OF SETTING.

When I can have plenty of manure, I manure heavily. Make your land rich enough to raise a good crop of corn or potatoes, and set it to strawberries. Upon a farm where land is plenty and labor is often scarce, I would recommend to plant them so as to do most of the work with a horse, or as much as possible. Hence it will be necessary to put your rows a greater distance apart. I would plant, say three and a half feet apart—three feet at least; plant in long rows, so you can cultivate more easily. Set the plants from twelve to fifteen inches apart in the rows. If you are going to set Crescents you may set them safely two feet apart in the row, and they will cover the ground during the season.

We will suppose you are getting Crescents with a few Wilson, or with a few Sharpless among them for fertilizers. The Crescent being a pistillate plant, it is best to set something near it for a fertilizer. Staminate varieties ought not to be used as they are great runners and destroy the bed. Wilson is a perfect flowering berry, the most so of any I have seen, having a perfect pistil and stamens; the stamens of Crescent are very small.

In my experience I have found it pays to pick off the blossoms the first year; it is not much work to do this. Amateurs don't like to do it after there is promise of some fruit; but it is better

to take off all the blossoms, keeping the strength in the plants the first season.

PROTECTION.

In the fall, as soon as the ground is frozen, I take marsh hay or straw; straw is just as good if there are no foul seeds in it. In Wisconsin straw has foul seeds in it generally so I prefer marsh hay. I cover the plants just so you can see the leaves. That is all there is to do till spring. In the spring do not be in too much of a hurry to uncover; the object of the covering is to protect the plants, for as you all know, in the spring we have freezing nights and it thaws day-times; consequently the ground will heave up and become very loose; in doing this it raises the plant a little breaking the roots of the plants, and this is a serious matter for your future crop. Hence I say don't be in a hurry to remove the covering.

DRAINAGE.

I should have said before that the ground should be well drained, either by surface or under-draining, or both; you can do both, but you should certainly use surface draining. No water should be allowed to stand upon the surface of the land or about the roots of the plants if a large crop of fruit is to be expected.

In the spring leave the plants covered till all danger from freezing nights is past, then remove the covering, and if you wish to leave it in the alleys you can do so, or if you can as well as not, take it off and sprinkle on some fine manure. If you have wood ashes you will find them a good fertilizer and a protection in time of drought. I had a very fine crop last season which I attributed largely to the fact that I used ashes for a dressing, putting on about one hundred bushels to the acre.

Mr. Hoxie. How can you get them?

Mr. Smith. Farmers generally burn wood and they can save their ashes. I am talking for the farmers of Minnesota. If you cannot get ashes then you can get fine manure and sprinkle it on the ground, and if your plants are not thoroughly protected by standing up against each other, put some of the covering back to serve as a mulching for the plants. Put on enough to protect from dirt and dust in very dry weather, and from the spattering of rain. Keep all weeds out.

By following this plan I do not think the ordinary farmer will

fail one year in twenty of having a good crop. I have myself failed but once in twenty-five years of having at least a good paying crop. Good sense and good judgment is all that is required in order to grow strawberries.

ABOUT VARIETIES.

A good deal depends upon using good plants. I wish to repeat what I said in part yesterday, don't be in a hurry to get these new varieties that come out and are being recommended by this man or that; wait till good reliable growers in your vicinity, or some men that you know are reliable, have tried them. You can grow varieties that will answer your purpose from those kinds now in use. If you have plenty of time and plenty of money, and like to experiment with new varieties that come along, you will find plenty of use for your time and money, and by the way, get very little in return for either! [Laughter].

Mr. Allen. Do you find any difference in using leached or unleached ashes?

Mr. Smith. Yes, sir; the leached ashes have the potash taken from them and that is an element that is very abundant in ashes and is beneficial to the plants.

RUST AND INSECTS.

Mr. Bunnell. Have you ever had any experience in burning over?

Mr. Smith. No, sir; I never could see any particular advantage to be gained by it. I wish to say to farmers don't plant strawberries twice upon the same ground, and don't allow your beds to get too old, as the insects are apt to get in and destroy the bed.

One of the most damaging things in strawberry culture in the United States is the practice of leaving the beds too long on the same ground, or if they are plowed up the ground is re-set to plants. In southern Illinois it has become a very serious question how to prevent damage from rust and from insects of one kind and another, until it is almost impossible to get a good crop there, or such as we in the North call a good, fair crop.

In my own experience I would say that I never re set the same ground until it has been cultivated a year or so in other crops, and I don't try to get more than one good crop from a bed. I raise the Wilson, because all things considered they have succeed-

ed better with me than any other variety. Where they do reasonably well I think you will find nothing to equal them. I understand it to be the fact they do not do as well in some portions of the country as they used to. But they do better with me, as I have said, than anything else. I never saw finer plants than mine were a month or so ago when I covered them, and never had a finer prospect for a crop another year than I have to-day.

Last year my crop averaged over two hundred and fifty bushels per acre, on three and a half acres of land. As I said, I have the Wilson; but if it does not do well in your neighborhood set the Crescents; if you want something nice, get the Manchester. It is later than Wilson, it lengthens out the season, is larger than Crescent and in form and color on the table I think it is the most beautiful of anything that ever I have seen. I have picked quarts of them that were just about as perfect in form as anything ever turned in a lathe; but they won't bear shipping as well as the Wilson, although they are fairly firm.

I have tried many new varieties and not a year passes but I turn under a lot of varieties that I have worked with three to five years and that I discard as worthless. I had a bed of James Vick of trial plants which I turned under as soon as the fruit was picked. I had Windsor Chief, Jas. Vick, Bidwell, Piper's Seedling, Sharpless, Kentucky, and several other varieties. I don't say they were all worthless, but as compared with Wilson they were not worth planting on my land.

MULCHING.

Prof. Porter. Have you ever tried mulching by sowing oats and allowing them to grow up so as to cover the plants?

Mr. Smith. No, sir; I spend money enough to get rid of weeds without planting them.

Prof. Porter. I have known it to be tried in several cases where it proved very effective. The oat plant grows up and in the winter makes a covering for the plants, and serves afterwards as a very fine mulch for them. Another question: Do you not consider in the prairie district that snow makes a very good covering?

Mr. Smith. The best of anything.

Prof. Porter. Yes, I have found that to be so, and for that reason it seems to me the oats would prove of advantage as the stalks would catch the drifting snow and hold it. Sugar cane

may be planted after the plants are well established and cleaned, allowing the stalks to grow up and afterwards to fall down to serve as a covering for the plants. They catch the drifting snow and serve as a bedding until they thaw out in the spring. In growing oats among plants you have to watch the oats that they do not get up more than eight or ten inches high.

Mr. Smith. I don't think that plan a feasible one. We depend upon September and October for the plants to make a certain amount of needed growth, which would be prevented by the proposed method of giving them protection.

Mr. Pearce. I noticed a bed of strawberries last fall that was treated in the manner described by Prof. Porter. The patch was sown in oats which grew some fifteen inches high and was then killed by the frost. What the result will be another spring remains to be seen. Another plan that might be tried would be to use dwarf sweet corn in place of the oats.

Mr. Cutler. I have had the best results where the snow drifted over the plants early in the winter, mixed with dirt from the fields. In the spring it served as a mulching for the plants. I prefer to have the snow cover them before the ground freezes. I had Crescents that were ripe the first of June this past season. It was the second crop. I got sixty dollars worth of berries from a small patch. If farmers on the prairie would always plant their strawberries on the south side of a grove of trees, they would be covered with snow and could raise berries without much trouble.

Mrs. Stager. We have had trouble for two years with what we supposed was caused by a small fly. The blossoms turned black.

Mr. Smith. The trouble was probably from frost or from a chilling of the blossoms. The Sharpless chills very easily. If you set Wilson's don't set anything with them, they are not as strong growers as the most of all other varieties. If you set Sharpless with them they will overrun and choke them to death.

Secretary Hillman. Have you had any experience with the leaf-roller?

Mr. Smith. Yes, sir; some years ago I discovered them on my grounds. I went over the bed with Paris green. That was years ago when I was trying to raise two crops from a single planting. I noticed the second year, as the plants were blooming, the leaf-rollers were at work again. I went over them a second time, having been over the field before, and gave them a

thorough sprinkling of Paris green. There were perhaps one-tenth of them in bloom. I don't know that I have seen a leaf-roller on my grounds since that time till last fall when I noticed a very few. I think it was the Paris green that destroyed them.

On motion of Mr. Cutler the chair was requested to appoint a legislative committee, the president to act as chairman of said committee. Prof. E. D. Porter and J. T. Grimes were named to compose said committee, with the president.

PLACE OF NEXT MEETING.

Prof. Porter moved that the place of holding the next meeting of the Society be left with the executive committee.

Mr. Cutler thought it was not good policy for a state institution like this to be placed on wheels and set running around the country. St. Paul and Minneapolis were the most central and the best for the interests of the Society, as well as most convenient for members.

Mr. Dartt thought the Society was a benefit to the locality where its meetings were held, and there were other sections of the State that were entitled to receive such benefits besides the cities named. Good meetings had been held in other parts of the State and quite as much had been accomplished for the cause as when the meeting had been held here. Although he had been pleased with the entertainment afforded at meetings held in Minneapolis, he could not say that he had been always satisfied in that regard with St. Paul. The Society ought to go to Mankato, as new fields were said to be good fields to work in; that was a thriving, growing town. The people of St. Paul did not need, perhaps, any more enthusiasm in horticulture. If the Society went to Mankato they might find a lot of horticultural "sinners," who if brought to "repentance" would help the cause. He favored the motion, as he would like to investigate and see what Owatonna could offer as an inducement for the next meeting.

The motion of Prof. Porter was adopted.

On motion, the following delegates were appointed to represent the Society at the meeting of the Wisconsin State Horticultural Society, to be held at Waukegan, Feb. 16—18, 1887, viz.: J. S. Harris, Prof. D. R. Meginnis and C. L. Smith.

On motion, President Elliot was named as delegate to represent this Society at the meeting of the American Pomological

Society, at Boston, in September next; Prof. E. D. Porter was named as alternate.

On motion of Mr. Harris, the proposed amendment to the constitution was adopted, authorizing the fee for life membership in the Society to be paid in two equal annual payments of five dollars each.

On motion, a resolution was adopted favoring an increase * in the number of reports of the Society published to 5,000 copies, of which number 2,000 should be bound in cloth.

On motion of Prof. Maginnis, the following preamble and resolution were adopted:

WHEREAS, The forests of Minnesota clearly have an important and beneficial moderating influence on its climate, and their preservation and conservation is of the highest importance to the horticultural and agricultural interests of this State in modifying extremes of heat in summer and of cold in winter, as shown by signal service records, and as a proper percentage of forests have an important influence in preserving the moisture needed for plant growth and in supplying springs and rivers, and as in our judgment the time has now arrived for prompt and decisive action needed for the preservation of the forest area we now have and by reforesting such portions of the State as have been denuded of their forests and are naturally unfit for continuous cultivation; Therefore, be it

Resolved, That the legislature now in session be memorialized to enact a law organizing a department or bureau of forestry, and furthermore, that we respectfully request the State Horticultural Society, the State Agricultural Society and the Forestry Association to appoint committees together, and to appear before such committee of the legislature as has jurisdiction in the matter, in order to bring about immediate action thereon; and furthermore, that Friday, the twenty-eighth day of January, be named as a date for the meeting of the said committees.

The chair appointed Messrs. Maginnis, Boxell and Smith to represent the Society.

Mr. Brand presented the following resolution which was adopted:

Resolved, That we believe our timber culture law should be so amended as to contain the following provisions, *viz*: That for every acre of the following evergreen trees, planted with not less than 2,700 trees to the acre and well cultivated for one year, the person so planting such trees shall be paid the sum of five dollars per acre for all land so planted, not exceeding ten acres; when said trees attain the height of four feet said planter shall

* Senator Hoard's bill providing for an increase in the number of horticultural reports, asked for by the resolution, passed the senate but was not reached for final passage in the house.

be paid another like sum per acre, if in good condition and standing not more than eight feet apart each way; and a like sum of five dollars per acre for the next five years thereafter, provided said trees are kept in good thrifty, growing condition. The varieties to be planted shall consist of either or all of the following: American White Spruce, White Pine, American Arbor Vitæ, Red Cedar.

Mr. Sias stated that Mr. C. H. Brett, of Henry, Dakota, the originator of the Brett Seedling, had written him that he intended to be present at this meeting of the Society; that he came as far as Mankato where he received word of a death in his family, causing his absence from the meeting. In view of the interest manifested by him in the cause of horticulture, he moved that the name of Mr. Brett be added to the roll of honorary members of the Society for five years. The motion was adopted.

Mr. Sias from the committee on Revision of Fruit List presented a report which was taken up for consideration and adopted. The list as revised is as follows:

FRUIT LISTS.

Following is a recapitulation of fruit lists adopted:

APPLES.

For general cultivation in favorable localities—Duchess, Autumn Streaked, Wealthy, Tetofsky.

For trial in limited quantities—White Russett, Russian Green, White Pigeon, Hibernial, Lieby, Red Cheeked, Red Anis, Green Transparent, Yellow Transparent, Thaler, Autonovka, Vargul, Raspberry.

HYBRIDS.

General cultivation—Whitney, Beach's Sweet, Early Strawberry, Orange Trancendent, (liable to blight), Powers Crab.

For trial—Florence, Martha, White Russett, Dartt's Hybrid, Pearce's Hybrid.

GRAPES.

For general cultivation—Worden, Moore's Early, Concord, Delaware.

In limited quantities—Martha, Rogers' 39, Brighton, Lady.

STRAWBERRIES.

For general cultivation — Wilson, Crescent Seedling, Downer's Prolific, Chas. Downing, Ironclad, Glendale.

For trial — Manchester, Windsor Chief, Minnetonka Chief.

RASPBERRIES.

Blackcaps; for general planting — Ohio, Doolittle, Gregg.

Red — Turner, Cuthbert, Brandywine, Philadelphia.

BLACKBERRIES.

Ancient Briton, Snyder, Stone's Hardy.

For trial — Thornless, Lucretia Dewberry.

CURRANTS.

Red — Red Dutch, Stewart's Seedling, Victoria.

White — White Dutch, Bailey's White, Long Bunch Holland.

Black — Black Naples.

GOOSEBERRIES.

American Seedling, Downing's Improved.

NATIVE PLUMS.

Harrison's Peach, Forest Garden, Weaver, De Soto.

For trial — Rollingstone.

Prof. Maginnis, from the committee on final resolutions, presented the following report, which was adopted.

FINAL RESOLUTIONS.

Resolved, Before final adjournment the members of the State Horticultural Society desire to thank the city of St. Paul for courtesies extended, the various railroads for accommodations so kindly given, and the committee congratulates the Society for the spirit of industry and harmony with which its proceedings have been characterized throughout its sessions.

Mr. Hoxie, of Wisconsin, said. He desired before the meeting closed to say a few words and to extend to the Society the hearty greetings of the Wisconsin State Horticultural Society. We feel in our state that it is only an imaginary line that divides us, and it seems to me in our work and spirit there is nothing that

divides us, the climate and soil of Wisconsin and Minnesota are similar. I am very sorry I could not have been here through all your deliberations as I have enjoyed the meeting greatly since I arrived, and though I have been here only a short time I feel as though I was entirely at home among you. Although many of the faces I see do not appear familiar, some of them I have seen before.

I may say here that we of Wisconsin and you of Minnesota have a work to do. The people should become interested in the work we are striving to accomplish. I do not know just how we are to do it. We are not gathered together as a set of lunatics merely to talk about trees and apples and to convey the idea that there is nothing to do in order to grow fruit. There is much to be learned in every department of our work. The utility and value of our ornamental shade trees, and everything of this kind has been brought to our notice at such meetings as this; we here obtain ideas as to how we may beautify our homes and make our lives pleasant, and how we may accomplish something that shall be of benefit to our race; we are not simply to look after the "almighty dollar" and strive for simply present needs alone.

I want to thank you as members of this Society for the hearty greetings received to-day and that we have always received from this Society in the past and we hope to reciprocate by extending as cordial a welcome to your delegates who may at any time attend our meetings. I am very glad to have had this opportunity to meet with you.

Mr. Cutler said he was much pleased with the discussions had and with the work accomplished at this meeting. There had been a desire manifested to do something that would prove a benefit to the farming community and he hoped in the future the Society would continue to prosper as it had heretofore in the past.

Mr. Dartt said there had been a resolution adopted with regard to establishing an experiment station at Owatonna and recommending that he be appointed as manager; he wished to say that if lightning should happen "to strike" in that direction that he wished to be in perfect harmony and accord with all the horticultural interests of the State. He hoped there would be no rivalry among members except a laudable one—to work for the best interests of the State. It was said that there was a good deal of rivalry between the cities of St. Paul and Minneapolis, but it was quite commendable in its way. He was

under obligations to the Society for the action taken and for this mark of confidence, and if there should be no practical result from the action taken he was still under obligations to the Society which he should not soon forget.

Mr. J. M. Smith. Mr. President, I have been with you before—some years since—and I want to say that I never attended a meeting of the Society with so good an impression of its power and of its value to the public, not only to the people of Minnesota, but to the people of our own state, as I shall carry with me when I take the night train this evening. The work you have done here—a part of it—has put me in a position that I can go home and know that I can root out one swindling establishment that has been selling trees in my county. I have known that the people were being robbed but I didn't know the entire facts of the matter as I know them now. The action that you have taken here in regard to these matters has put me in a position so that I can go home and act; I propose to do so and reform that matter so far as our county is concerned, and to do it at once, or have the men taken care of—that is all there is of it.

I think Mr. Hoxie and myself will both feel that we have gained information that will enable us to assist in placing our horticultural work in Wisconsin on a better basis than ever it has been before. It has been an annoyance to me ever since I have been president of our society to think that we could not get hold of these men that were robbing our people, especially when I see car loads of stock coming in and know of its selling at three or four times its value, and its value little or nothing sometimes. I think this movement will end in something that will put our horticultural work on a firm basis—putting it on a straight, square, honest business basis; so that men who wish to engage in the business will meet with some encouragement in conducting a business in that manner.

I want to thank the Society for their courtesies and kindness to myself and to repeat the invitation extended by Mr. Hoxie to attend the meeting of our society; we shall be glad to meet just as many as see fit to come; we may not be able to teach you but we will guarantee to have a good time.

President Elliott said he ought perhaps to say a word in closing this meeting. He had always tried to do that which he thought to be for the best interests of the Society and of the public at large. He was gratified with the harmony which had always prevailed. If there was anything that had arisen at this

meeting that looked as though they were trying to ignore one class for the sake of advancing the interest of another he hoped it would be looked upon with charity. We are all selfish beings and we all have personal interests and they sometimes clash to some extent, but we are trying to accomplish the greatest good to the greatest number. He was gratified with the words of encouragement received from Mr. Smith and to know that there were others ready and willing to assist us in the good cause. We have had up-hill work in this calling of horticulture, but if we persevere and press forward we shall yet be successful, and will succeed in raising many fruits in Minnesota, that are considered of doubtful value at the present time. If we can prevail upon members of the legislature to look upon the interests we represent in a proper manner there will be no trouble in obtaining such assistance as may be needed in carrying forward the work. In conversation with our governor recently he said we must not be too modest in our demands, and we have in him one who is willing to do all in his power to aid the producing classes. I hope the members of our Society as they depart to their homes will go with a determination to increase our membership and extend our influence, to do what they can to establish and build up a strong and efficient horticultural organization in our State.

Mr. C. L. Smith. I want to say that I feel gratified with the action taken by this Society in regard to the sale of foreign-grown nursery stock. While it may appear that some have been persistent in pushing this matter, yet those who have been out among the people on the prairies and have seen them suffer loss in time and money, will understand the reason. No act of the Society, it seems to me, will have a greater influence for the interests of the people than the action taken in regard to the fraudulent selling of trees and shrubs. The influence of our Society is growing and it is extending its influence into more homes and communities than ever before. We are now changing from the condition of pioneers, with our sod houses and straw sheds, on our open prairie farms, to the more intensive system of farming. These marks of the pioneers are giving way to more comfortable dwellings and barns, with neat sheds, all surrounded with trees and windbreaks. We have a better system of farming, better breeds of stock, and the work upon the farm generally is carried on more upon an intensive plan than formerly; more attention is given to small fruit and vegetables. The State is ripe for the work to be done by our Society; I believe the legislature will

grant us any needed assistance that may be asked at their hands. It seems to me we have a bright future before us and we may make our Society more useful in the future than in the past. I am sure the people are well satisfied with the progress made and the work we are doing.

Mr. Hoxie. I have sometimes thought we might accomplish more by adopting the methods used by the Massachusetts society; they hold weekly meetings and issue bulletins giving an outline of their proceedings, thus getting their transactions before the people at once. Farmers are eager to get these reports, and if some such system could be adopted here, I think much benefit would be derived from it.

Mr. Smith. At the meeting of our Hennepin County Horticultural Society, this plan has been practiced to some extent. One of the city papers sent a shorthand reporter to write up the proceedings, sometimes giving two or three columns in their reports. The proprietors of the paper were well pleased with the result of that work. They found their readers appreciated the enterprise. I understand these meetings are to be revived.

Mr. Harris. I think I speak the sentiments of all present when I say this has been an interesting and profitable session of the Society. There has been as good a degree of harmony as could reasonably be expected in so large a company of men from so many different portions of the State, pursuing so many different branches of horticulture. It is for our interest to work in harmony with regard to the general objects had in view. I hope when we go to our homes we may not forget the many lessons learned while here, but be like the ministers who have been up to the general assembly, that we may carry some of the spirit of our work with us and make it a leaven that will work in our several neighborhoods, encouraging our neighbors and friends to plant trees and to give them proper cultivation, and eventually to become active members and workers of this Society. It is one thing to be a member, to pay in a dollar and receive the annual report of the transactions, and quite another thing to make it the leading aim and object of your life to carry forward the work in which you have enlisted after once having identified yourself with this organization.

I may say that I have to some extent made this a life work. Our Society has been in existence for more than twenty years; and I have often felt gratified that my name was at the head of the list of names first enrolled of its members, and that I could

do something to encourage the people in horticultural pursuits, and be a co-worker with those who would fill our homes with fruits and flowers, and add their mite to make the State better and more attractive for their having lived in it. I have tried to add to the membership and to extend the influence of the Society; if I have accomplished anything I am thankful for it, because I feel that my ability is but little. But we have all more or less influence. If we would all make it an object to encourage the growing of flowers in and about our homes and beautifying the grounds about our churches, and in our cemeteries, our lawns and parks, we would accomplish a great work for the State of Minnesota and give it a more enviable name than it now has. It seems to me the "North Star State" is one of the finest states of the Union. I have said before this that if we would follow the advice of that venerable horticulturist the late Marshall P. Wilder who said, "Plant the most mature and perfect seeds of the most hardy, vigorous and valuable varieties, and as a shorter process, insuring more certain and happy results, cross and hybridize our finest kinds for still greater excellence," that the time is not distant when we should have a long list of fruits perfectly hardy, adapted to the climate of the Northwest. I believe the time may yet come when Minnesota apples as well as other fruits will be sought for in eastern markets and perhaps across the great waters in Europe. If we work in harmony and are persistent in our efforts we can at least promote the objects sought and hasten the fulfillment of our plans.

Gentlemen, I wish you to extend a vote of thanks to our worthy president. He is one who has always stood by the Minnesota State Horticultural Society. When I was in such poverty that I could not attend its meetings his purse was opened widely, and he has rendered me and other members of this Society encouragement and help in building up the Society. He has ably presided at this meeting, and perhaps treated us with greater courtesy than we deserve; I therefore move a vote of thanks be given him for his faithful service during the past year.

Mr. Smith suggested that the secretary be also included. The motion was adopted.

The secretary responded briefly, returning thanks to the Society for kindly assistance rendered him in conducting the duties of the office which had again been intrusted to his hands, and for this mark of their confidence and esteem. He had somewhat reluctantly accepted the position of secretary for another term.

as he feared a press of other duties would prevent his giving such attention to the work as was properly demanded by the Society. He hoped, however, any seeming lack in this regard would be viewed with charity, as it would be his endeavor and earnest desire to serve the Society as their secretary faithfully.

On motion of Mr. Brand, a vote of thanks was given Mrs. E. J. Stager, of Sank Rapids, for her constant attendance and the interest manifested by her in the meetings of the Society.

The fruit list was then taken up for revision and adopted in the form already given on a preceding page.

On motion, the meeting adjourned *sine die*.



THE LAW RELATING TO THE PRINTING AND DISTRIBUTION OF THE HORTICULTURAL REPORTS.

Chapter 8, General Laws of 1883.

AN ACT TO AMEND CHAPTER SEVENTY-TWO (72) OF THE GENERAL LAWS OF ONE THOUSAND EIGHT HUNDRED AND EIGHTY-ONE (1881), RELATING TO THE STATE HORTICULTURAL SOCIETY.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. Sections one (1) and two (2) of chapter seventy-two (72) of the General Laws of one thousand eight hundred and eighty-one (1881) relating to the State Horticultural Society shall be amended so as to read as follows:

Sec. 1. There shall be annually printed and bound thirty-five hundred (3500) copies of the annual report of the State Horticultural Society, provided the number of printed pages of the same shall not exceed five hundred (500); which report shall be transmitted to the governor, and shall be distributed by the State Horticultural Society, as follows:

One (1) copy to each of the State officers, members of the legislature, judges and clerks of the supreme and district courts, county auditors and members of the board of regents and faculty of the State University; fifty (50) copies to the State Historical Society; one hundred (100) copies to the State Board of Immigration; one hundred (100) copies to the State Agricultural Society in exchange for a like number of its annual reports; and a sufficient number of copies to each county horticultural society to supply one (1) copy to each of its members; provided, such county society shall be in active existence, and shall have filed with the secretary of the State Horticultural Society a list of its officers and committees, and an abstract of its proceedings for the year preceding; and the remaining copies shall be distributed by the State Horticultural Society, in such manner as it shall deem best, after retaining a sufficient number for its library and to supply future members and exchanges.

SEC. 2. This act shall take effect and be in force from and after its passage.

Approved February 28, 1883.

SECRETARY'S PORTFOLIO.

DEFERRED PAPERS, REPORTS, NOTES, EXTRACTS. ETC.

INTRODUCTORY NOTE BY THE SECRETARY.

The following pages are presented in addition to the routine report of proceedings at the summer and winter meetings of the Society, embracing reports, additional papers, extracts, etc., of more or less interest.

As will be seen upon inspection of the foregoing pages, in the discussions had at the various meetings, and in the papers read, some effort has been shown to gain conciseness and brevity of statement, while seeking to preserve the substance of the subject or the matter had in view. There is a gratifying lack of needless repetition as well as lengthy, prosy papers, made up of measured words and sentences, which might be calculated more to "lumber" up the work than adding to the interest and real value of the same.

In this enlightened age, when knowledge is so much advanced and spread abroad in all departments and avenues of trade, as well as in the boundless realm of art and science, there is the greater need for special training in varied lines of work. And it is more imperative than ever heretofore that those who would succeed in any avocation be *specialists* and thorough *masters* in their chosen field of work. Horticultural science, too, is no exception to the rule; for he who would succeed and make the most of opportunities within his easy reach must use those means of gaining information which are alike most practical and simple, and which may easily be understood and readily applied.

The Society's transactions, as well as other matters to be found in this report, should be directed mainly, we presume, to that which properly relates to Minnesota horticulture, and hence there should be no desire to cumber our transactions with foreign and extraneous matters, which would perhaps require much space and at the same time be of little interest or real value to the general reader. Our members much prefer, we apprehend, that their report should be directed to the presentation of those things which are most intimately joined with their material welfare.

The Society is under obligations to *Farm, Stock and Home* for use of cuts to illustrate papers on grape culture and grafting.

We might here add that while there may be very many valuable suggestions to be found in horticultural periodicals, as well as in reports received from other kindred organizations, still lack of space precludes the possibility of giving these a place or even passing mention. We read all these with pleasure, and profit from the many useful lessons to be found therein, and heartily commend them to the thoughtful reader, since most of these are in the easy reach of all.

REPORT OF DELEGATE TO WISCONSIN.

The annual meeting of the Wisconsin State Horticultural Society was held at Waukesha, Wis., Feb. 16, 17 and 18, 1887.

For many years the annual winter meetings of the society have been held at Madison in the first week of February. The annual conventions of the State Agricultural Society, State Dairymens Association and State Amber Cane Association were also held at the same time and place. It was found that where so many conventions were being held at the same time and place the stronger and greater attraction proved detrimental to the others. Therefore, this year the horticulturists chose a later date and a new place for their meeting, which was held in the thrifty town of Waukesha, situated about twenty miles west from Milwaukee.

The program for the occasion was very complete, and the subjects presented were such as would tend to instruct and enthuse the members present. The attendance of Wisconsin horticulturists was very good, and included most of those who had been prominent workers in the cause for many years. There were present as delegates from other states, Messrs. J. V. Cotta, of Illinois; C. G. Patten and J. Wragg, of Iowa; Chas. W. Garfield and Prof. A. J. Cook, of Michigan; D. R. Maginnis and J. S. Harris, of Minnesota.

The meeting was opened at 2 P. M., on the sixteenth, with an address of welcome by Hon. Alexander Cook, of Waukesha, in which he complimented the society upon its high and ennobling aims, and the zeal with which it had fostered the highest and most ennobling sentiments and inculcated them among the people of Wisconsin, the love of the useful and beautiful in nature, and especially the love for fruits and flowers. He alluded to the wonderful impetus that had been given to horticultural development and progress in the Northwest in the last score of years, through the earnest efforts of this society and kindred organizations in other states, and thought that we were now but standing on the threshold of an era of expansion of horticultural knowledge such as the world had never before conceived of.

Mr. B. F. Adams, of Madison, delivered an appropriate response to the address of welcome, reviewing the work of the society in the past and expressing the opinion that the present outlook was very encouraging, and closed his remarks by saying that the "thoroughbred Wisconsin horticulturist possesses an enthusiasm that the coldest winds of winter or the strongest heats of summer could not overcome."

The remainder of the afternoon session was taken up with the reports of the secretary and other officers, committees, delegates to other state meetings and the election of officers.

The secretary in his report made an urgent plea for an increased membership. Thought the free distribution of reports tended to discourage membership and that the summer meetings held at different places in the State had added greatly to the strength and usefulness of the society. He gave irresponsible tree tramps some hard raps, but did not favor legislation on the subject. Thought the education to be gained through more meetings and farmers' institutes was the only available remedy. They would flourish in spite of all laws as long as there was ignorance of horticulture among the farmers.

Mr. G. J. Kellogg's report as delegate to the Illinois meeting showed that the apple question was but little nearer solved in that state than in Wisconsin and Minnesota. He said: "Half of the orchards in Northern Illinois are on the wood pile and the other half are leaning strongly that way." Nursery men and tree peddlers are not helping the matter, although they are profiting by the misfortunes of the planters.

Mr. A. G. Tuttle was the delegate to the Iowa meeting. He thought Iowa was on the right track and making rapid advances in testing the adaptability of Russian varieties. He said: "At least twenty-six varieties of Russians will compare favorably with the Duchess for hardiness and are as good in quality as an equal number of American varieties." Numerous varieties were being propagated at the agricultural experiment station at Ames, and Prof. Budd had distributed trees to over six hundred parties in Iowa, Minnesota and Dakota, to be tested and reported upon.

The evening session was opened with a paper on "Ornamental Trees," by A. L. Hatch, of Ithaca. He is a vigorous writer and a very earnest horticulturist. He cautioned against overplanting. Too close planting is a very general fault. Single specimens with ample room for development give the best effect. Harmony in form and color ought to be considered in all planting. Many planters crowd their grounds with such varieties as a traveling agent recommends at exorbitant prices and overlook the sugar maple, native white birch, American linden, hackberry and other beautiful natives that can frequently be had for the digging.

Mrs. Huntley followed with a paper on "Plants and Flowers for the Home." She said: "Our homes are what we make them. The young farmer can plant a few trees and shrubs when he sows his first crop. He can devote a little time to the garden from the very start. The woman can give a little time to the growing of flowers from the first. Their culture tends to elevate and purify the mind, and gives the dusty walks of life many a charm that can not be found where they are wanting, and they will afford relaxation from indoor labor." No other class of workers have so good an opportunity for ornamenting their homes as the farmer. The little beginnings made at the start will grow and expand into beautiful surroundings of a happy home. It is a misfortune for children to be reared in a home where there is no adornment. It is criminal in the parents to

neglect to beautify the surroundings of the home, and it tends to poverty. The lawn should always be as fresh and green as grass can make it. The vegetable garden will yield its fruits in a few short months. The strawberry bed will give its ripe fruit in fourteen months from planting, and the raspberry only a month later. She knew one farmer who plants a few trees upon the birth of each child, and they are that child's trees. Why should not all do likewise? And then our children would be a generation of horticulturists. Horticulture has always made the world more beautiful, home happier and human life better.

An interesting discussion followed the reading of the paper. The points brought out were heartily approved, with the suggestion that the house plants should be our plants instead of "my wife's plants."

At this point Chas. W. Garfield, secretary of the Michigan Horticultural Society, and of the American Pomological Society, was introduced, and spoke at length of the workings of the Michigan Society, and advocated the encouragement of local and county societies and the establishment of experimental stations.

The next paper read was on the "Slaughter of the Birds," by Mrs. Ida E. Tillson, of West Salem, in which was shown in a happy manner the blessing of birds to the agriculturist and horticulturist, as their food consisted principally of injurious insects. She alluded to the principal causes that tended to diminish the number of birds and threatened the extermination of some of the most useful species. It was not enough that the electric lights killed them by thousands, and the town boys — "embryo hunters," armed with deadly shot guns — roamed far and wide and from pure wantonness slay all they can find and rob the nests of such as escape, so that in the neighborhood of our villages the quails, larks, blue jays, orioles and other summer songsters can not find a place to rest their weary wing, but the women have added another incentive for their destruction, by adopting a fashion that would shame the barbarians, giving birds a commercial value; and so great is their demand for them for making their "head gear" hideous that the most secluded resorts no longer afford protection for such as are clothed with bright plumage. Unless this slaughter is stopped disaster is sure to follow. Insects will increase to an alarming extent and destroy our crops and our land will become a dreary waste.

SECOND DAY.

This forenoon President Smith read his annual address, in which he reviewed the workings of the society, and the lessons of the season. In alluding to the great drought of last summer he said that experience had demonstrated that good cultivation was the best preventive to injuries to crops in times of drought. He alluded to the L. L. May Nursery Company of St. Paul, and said they had operated extensively in Brown County, through an agent, and sold large quantities of trees and plants at prices little less than robbery, and he could not see wherein their operations differed very much from obtaining money under false pretenses. The operations of such agents are very detrimental to horticulture in the Northwest. Was much pleased with the course taken by the Minnesota Society in the matter, and did not think they scored any points by appearing before our Society. He urged the dissemination of such information through the working of the society as shall educate the farmers to be on their guard against all suspicious tree men, and that the society exercise great care in recommending varieties for general cultivation. A more thorough organization of local societies would prove a partial remedy, as this class of men were disposed to shun those who were well posted on trees and plants.

The remainder of the forenoon was occupied by Prof. Cook, of Michigan, in delivering an illustrated lecture on "Insects Injurious to Plant Life, and Means of Destroying Them." In speaking of the codling moth he says it can not be caught with sweetened water, is not attracted into the house by lights, that they are great respecters of prior rights, and never deposit but one egg in an apple, and no matter how numerous they are, have an instinct to pass by every fruit in which an egg has been deposited by another insect. In speaking of remedies he condemned the old bunch remedy as a failure. The hog remedy is better, as much of the affected fruit falls to the ground before the worms escape, and if at once eaten by hogs will prevent propagation. He told of an orchardist who had about exterminated them on his place by employing boys to pick all infected fruit, and it paid him well to do it. He considered the best remedy to be Paris Green or London Purple, applied when the fruit is about the size of a pea, and said there would not be a trace of the poison remaining two months afterward. To be effective one pound of the poison is put into one hundred gallons of

water and applied with a Holman pump or garden syringe. For large orchards he would use the Field pump with the Dixon spray nozzle. Cattle and other stock must be kept out of the orchard until after two or three heavy rains have fallen.

The "borer" is easily destroyed by using an emulsion of one pint of crude carbolic acid and one quart of soft soap, put into two gallons of water. This emulsion should be applied to the body of the tree with a brush, about the first of June. It also kills the scale or bark louse and fungus growths and helps the tree to endure the following winter.

In this manner he went through the various tribes of the most injurious insects, illustrating them with large drawings and pointing out the best known remedies for each and advised all fruit growers to interest their children in the study of insects and train them to become familiar with their habits and transformations.

In our opinion this lecture, and a paper upon the same subject read the next day by J. S. Stickney, were the crowning features of the meeting and worth many times more to the state than the small sum annually appropriated to aid the society. Here we would suggest that an effort be made to arrange with Mr. Cook to repeat the lecture before our Society at our next annual meeting.

Chas. W. Garfield occupied one hour of the afternoon session and made a good talk on the subject, "How, When and Where to Teach Horticulture." He is an enthusiast, and gained the attention and admiration of the audience.

The remainder of the program was fully carried out and there was an increasing interest from the opening to the close of the meeting and at the final adjournment everyone present pronounced it the best meeting yet held by the society.

I should like to give a further notice of the remaining papers but the length of my report will not permit me to dwell longer in this field, where I have been so well entertained. I must, however, allude to Mrs. Hollister's paper upon "Life of Women on the Farm, as it is and as it should be;" "The Ethics of Horticulture," by Mrs. Campbell. I heartily wish every farmer and his wife in the Northwest could have heard them. I feel like congratulating the Wisconsin society on their having enlisted the co-operation of so many of their talented women in their work.

THE EXHIBITS.

The fruit exhibit was an attractive feature of the meeting. There were nearly five hundred plates heaped with the best specimens of apples grown in the state, also a dozen or so varieties of grapes, a few pears and an elegant display of winter-blooming plants. Our old friend Peffer, of Pewaukee, exhibited 102 varieties, 31 of them being some of his newer varieties of seedlings and some others, varieties he has originated within the last 30 years.

Mr. Jeffrey showed 67 varieties, Mr. Hirschinger, of Baraboo, 60 and Kellogg, Pilgrim and others made fine exhibits, while Mr. Springer was on hand with 35 varieties of the Waupaca County seedlings. Some of the collections must have been kept in cold storage as we saw Duchess, St. Lawrence and other autumn varieties as fair and fresh as if they were picked from the trees but yesterday.

The bulk of the fruit on exhibition was grown in what is known as the Lake Belt, and in Central Wisconsin. The seedlings exhibited were remarkable for beauty of appearance and in quality would compare favorably with an equal number of the older varieties in cultivation; most of them are proving hardier where they originated than most of the old varieties. Some of them are long keepers. Perhaps few, if any, of them will prove adapted to the more unfavored parts of Minnesota and Dakota, but they afford us a valuable lesson and encourage us to work on in the production of seedlings.

A few varieties of Russians were on exhibition. I must confess that I am disappointed in not seeing more of them. There were but four varieties that I should judge to be good keepers. The Repka Malenka is of fair size, of very good quality and may keep until April. Samples of the wood indicate extreme hardness of tree. Red Queen is a good keeper but not as hardy. Longfield is in season now, quality good, fruit hardly large enough for market. One other (name lost) has indications of being a good keeper and will be valuable for cooking. Other varieties were not in condition to judge of their merits, they having been kept over from exhibition at the fall fairs.

JESSIE STRAWBERRY.

This is a variety of Wisconsin origin and is just now enjoying a "boom." The originator, F. W. Loudon, of Janesville, is a

man of undoubted integrity and he has made the cultivation and propagation of strawberries a study for years. The members of the Wisconsin State Horticultural Society who met at Janesville June 16 and 17, 1886, are too intelligent a set of men to be humbugged. They beheld the berries growing upon the originator's grounds and were astonished. It is undoubtedly a wonderful berry where it originated, but will it prove the berry for the million? Will it supersede all other varieties in cultivation? Probably not. From some things I have heard I conclude there are two sides to the question. Some people are not as skillful growers of the new varieties as others; some have not the same kind of soil as that upon which it originated, and others may not manipulate the fertilizers just right. I fear it is being too highly praised. In favored situations, with good cultivation, it will probably prove all that is claimed for it, but away from home and with the cultivation ordinarily bestowed upon strawberries, I doubt if it will prove superior to many other varieties we now have. The Sharpless, Bidwell, Vick and many others had their "boom." How many here in the Northwest who tried them have realized their high expectations? It is hard to get the whole truth about new sorts. Do not understand me as opposing the introduction of this or any other new variety. I am not, but like to have it thoroughly tested in a wide range of localities, and it ought to have been done before the "boom" was started. The most unfortunate thing I see in this is that the originator has given up the entire control of its introduction to a New York nurseryman, reliable, it is true, but many of us know by sad experience the disadvantage of purchasing plants that have been reshipped and repacked over getting them direct from the grower. It is a critical time in the life of a strawberry plant while it is out of the ground. It is liable all the time to be taking injury from drying, heating, or from making a blanched growth at the expense of its own vitality, and I would rather risk one plant direct from the grower than five through second hands.

Those who desire to try the variety should by all means order direct from headquarters. Doubtless every agent that travels the country the coming year will solicit your order for a dozen or more of this variety. If you consult your own interest you will permit them to pass on with their stock undiminished and get your plants direct from the man who raised them or who controls the stock.

Permit me, in conclusion, to tender my thanks to the members of the Wisconsin Society for the many courtesies extended to your delegates, and for the deep interest they manifest in the welfare of our Society, and also to the members of the Minnesota Society for the high privilege they conferred upon me in making me their delegate upon this and other occasions. Respectfully submitted.

J. S. HARRIS.

OLMSTED COUNTY HORTICULTURAL SOCIETY.

In addition to the report of the secretary of the Olmsted County Horticultural Society, Mr. M. J. Hoag, at the annual meeting of this Society, the following is presented from the *Rochester Record and Union*, from its report of the proceedings of that society:

The annual meeting of the Olmsted County Horticulturists was held in the city hall Saturday afternoon, January 8th.

Mr. A. W. Sias, President of the society, read the following paper:

OBJECT LESSONS IN HORTICULTURE.

Gentlemen of the Olmsted County Horticultural Society :

There is no way by which the student can gain a knowledge of the art of horticulture so rapidly as by object lessons. And this calls up the question of where can we obtain the most complete objects from which to *take* our lessons? Nature's most sublime botanical specimens are to be found in the forests; go there. The Menonite Christians at Mt. Lebanon hold annually a celebration of the Transfiguration under the existing trees, known as the "Feast of Cedars." And we should have not only our "Feast of Cedars," but our feast of pines, spruces, firs, hemlocks, poplars, elms, lindens, hackberries and perhaps the sweetest of all should be the feast of the maple, on which occasion some zealous brother should treat all hands to an old-fashioned "sugaring off."

Gentlemen, I believe it possible for the members of this little obscure horticultural society to inaugurate a new departure in horticultural work that shall be followed and imitated by coming generations through all future time. The plan hurriedly and roughly marked out is for the society to meet every sum-

have their feasts as indicated above. Always under the the most gigantic tree of a certain variety (to be selected by a committee of three), to be found, say within a limit of five miles of this city. The next season select another variety and proceed as before, and so on until every variety has been visited and passed upon. Make it the duty of the society to make and keep a neat and permanent record of the growth of these trees. When the tables are set and loaded with the choicest fruits of the season and surrounded by the members of the society, have some good artist handily sketch the scene, the secretary to be instructed to place the sketch in the society's book, under which to make a record of the aforesaid tree, giving name, height, circumference, where located, exposure to sun and wind, nearness to water, chemical analysis of the soil, a microscopical examination of the style and condition of the leaves, etc. A thick waxy leaf, like the Aloe, or Century plant, that is obliged to suck up moisture enough to take it through a protracted drought of five months, will do for Minnesota. When you come to your feast of the apple under some giant wild crab tree, doubtless ascertain just about what sort of a leaf we have in our apple orchards. The great benefit to be derived from this new mode of conducting our summer meetings must, I think, be clearly apparent to all.

While doing committee work for the State Horticultural Society last fall, it was my good fortune to be able to visit "the bubbling brook," Kedron, in Fillmore County, where, in company with G. W. Fuller, of Litchfield, we feasted our eyes on what I thought to be the tallest specimen of the *Abies Alba* on the continent. Also White Pines, Fir Balsams, Red Cedars and Yew. I would suggest this as a proper place for you to celebrate the anniversary of the Spruces. Mt. Horeb and Resurrection Spring are nearby. If you can explain why the above named White Spruces made such wonderful growth, it will be information of value to everyone who plants a tree of this desirable variety. Someone gave as reason for the Green Mountain boys growing so tall, was, "because they were in the habit of going out every morning before daylight to stretch their necks up over the mountain to see the sun rise." In a like manner it occurred to me that this spruce was making a desperate effort to get a glimpse of the sun. The soil about the roots of these spruces is alluvial and leaf mould. These object lessons are worthy

of the closest scrutiny by the oldest minds. We have a Cottonwood some two miles down the Zumbro that measures nineteen and three-fourths feet in circumference. We must have our feast of the Poplars under the generous shade of this mammoth tree some time in the near future. While I should not care to see you travel all the way to these monarchs of the forest on your knees, like some of the religious devotees of the East, yet I would like to see you pay them more respect than you have heretofore been in the habit of doing.

Our late Consul to Calcutta, J. A. Leonard, of this city, has perhaps the largest flowering maple to be found within the city limits. Mr. Leonard kindly called our attention to this fine botanical specimen as an object lesson, showing the utility of heavy mulching in a dry climate, where rapid growth is required. This tree was planted twenty years ago near the doctor's residence, and for many years stove wood was sawed and piled around the trunk, some five or six feet high, resulting in a most rapid growth, more than double, in fact, that of other trees of the same variety, and planted at the same time, and not heavily mulched. Downing said "among all the species, both native and foreign, we consider the scarlet flowering maple as decidedly the most ornamental species." I wish to call your attention to the maple, as an object lesson on mulching, worthy of the most careful study. Dr. Leonard's grounds on the Zumbro remind me of the beautiful residence of N. P. Willis, on the Hudson, "Idlewild," of which Downing said, "It is a piece of Nature's landscape gardening which the hand of man should, and, from the good taste of the owner, has not been allowed to appear, except in the necessary buildings * * and we refer to it simply to show how delicate and refined that taste must be which, appreciating all that Nature has done with so much prodigality of beauty, as at 'Idlewild,' has the courage to let her alone." I am inclined to the opinion that the doctor would have "let her alone" severely had it not been for the fact that we made a small importation of trees through him, and his characteristic liberality, while consul at Edinburgh, direct from the old home of Robert Burns. The love of the immortal poet was too much for him, and the sanctity of "Idlewild" was invaded and a group of beautiful dwarf evergreens and a Roman tree now holding a conspicuous place at "Idlewild," on the banks of the beautiful Zumbro.

The valley of Jehoshaphat, through which flows Kedron, is very deep and is the native home of the Cedar of Lebanon, some of

which are said to measure thirty-six feet in circumference, of which some writer has said: "For glory of beauty, unequaled among all the objects of the vegetable kingdom." Downing says: "Washingtonia gigantea the mammoth tree." This truly most magnificent of trees—deciduous or evergreen—was discovered in a valley of the source of one of the tributaries at the Calaveras, California. Within an area of fifty acres only, ninety-two of the species were found standing, without doubt the most stupendous vegetable product on earth; discovered in 1850. Some forty years ago I saw in the valley of the St. Johns River, Canada, one of the most graceful and majestic botanical specimens that it has ever been my good fortune to behold. A white elm, perhaps seventy-five feet to the first limbs, and the branches drooping so gracefully down, rendered an object lesson of rare majestic beauty. I was younger than I am now, but I never could forget that tree. The most conspicuous object lessons among apple trees, as far as my observations have extended, were found in the valley of the Genesee River, a Northern Spy tree that measured twelve feet in circumference.

The horticulturist, like the politician and artist, is satisfied with nothing but the best models. The politician's objective points are the county seats, state capitols and the capitol at Washington. Nearly all our ex-presidents have held seats in Congress, the others being military heroes. They study the lives of the greatest statesmen, while we study the lives of the greatest botanical specimens. And in all the departments of human knowledge that man is the most successful who keeps the nearest to, and draws inspiration from, the very best models. The states west of the Mississippi have never produced a president, while Virginia, lying in plain sight of the great object lesson—the dome of the capitol—has given us five; no other state but two.

Excuse me, gentlemen, when I began this paper I did not mean to touch on politics or religion, and for fear I may be led still further astray, I will sum up and see if there is anything of importance to the horticulturist to be gleaned from our random observations upon object lessons:

First — Our most magnificent models are in the rich valleys.

Second — Near living water.

Third — In alluvial soil.

Fourth — Whether wind is broken by mountains and high hills.

Fifth — Where the sun strikes but a small part of the day.

Sixth — In case of transplanted trees where the mulching has been heavy.

Finally, gentlemen, keep your eye on Nature's grandest works! Hide not your light selfishly "under a bushel." Be not discouraged in well doing, for even if our membership is small, remember that "he that is faithful in few things shall be made ruler over many." That man that acted *faithfully* as our secretary for seven years, when the Society was no more prosperous than now, is at present the secretary of one of the most prosperous and honored state societies in the Union, with a membership of one hundred and eighty of the most intelligent men in the State. The man who was acting as private secretary to the governor a short time ago is now governor himself.

Some of you have attempted to change the plan of Nature, who gives to nearly all our Minnesota wild trees a thick, pubescent leaf, by ordering a large share of your trees from the South, where they deal largely in *thin-leaved plants*, and are constantly sending the same to you. They are capable of storing up moisture enough to take them about half way through our summer months — hence they die. To be consistent, order a pump that will furnish you water for only half your stock. The leaves pump water for all our plants and here in this arid clime they *must be large and thick*.

A paper from Mr. Harris, who was appointed entomologist for the society last year, was read, it being a most instructive and pleasing one. He took for his subject the "Codling Moth," giving various methods for exterminating it.

THE CODLING MOTH.

By J. S. Harris, La Crescent.

Mr. President and Members of the Olmsted County Horticultural Society:

I noticed in the report of your last annual meeting that your man — Sias — had attempted to perpetrate a practical joke on you by having me elected as entomologist for your society. If my life should be spared, I hope at some future time to get even with him. He knows that I am not a professor of entomology, and perhaps do not understand the nature and habits of the majority of the bug world any better than most of you. It is true that I have put in a little time studying that chief of bugs, the "humbug," and have always found that his feet were hot and

left an unpleasant sensation wherever he has alighted, and have frequently sent forth notes of warning to my suffering fellow horticulturists. I have also taken a few observations of a few smaller insects that frequently do us considerable harm, but I have not got far enough along to have become case-hardened, and announce myself a full fledged professor, who desires to entertain (bore is perhaps the more appropriate term) you with a long drawn out treatise on the fascination and delight of a study that captivates the imagination and renders the enthusiast liable to construct and spin out descriptions and theories so long that there is no room left for discussion.

Insects are abundant in this country, and rapidly on the increase, and how to head them off is a problem yet unsolved, and in Minnesota but little effort has been made to bring about its solution. We last year gave you a brief and imperfect description of the "Apple Curculio," the insect which is the prime cause of so many of the knotty specimens of apples in some of our orchards.

We have with us another insect that was introduced into this country from Europe, commonly called the "Codling Moth," (*Carpocapsa pomonella* Linn), that is fully as injurious to the apple, but I think if fully understood, might be much more easily exterminated, especially by a concerted effort of the orchardists of a neighborhood. The habits of this pest are not generally well known, and but few persons have ever seen and recognized it in its moth or perfect state. It is one of the most beautiful of the moth tribe, but that is a poor consolation to the man who has none but wormy apples to eat. These moths measure about three-fourths of an inch across the wings when expanded, and are of a brownish gray color, crossed by numerous darker and lighter colored wavy lines. There is a dark brown spot of an oval shape near the margin of each upper wing. The under wings are brownish gray, much lighter than the upper and not shaded similarly, but shaded darker near the margin. They remain quiet during the day, and, owing to their color, are not easily detected, but they come forth and fly about at evening, and numbers of them may be seen in the month of June and later flitting about the apple trees.

By the most careful observations made by Fitch, Harris, Riley, Le Baron and others and corroborated by my own, it is generally conceded that they are two-brooded, or that two generations are produced each year. The parents of the first brood

have hibernated during the winter in the larva state, in cocoons which are concealed under the permanent scales or in the deep fissures of the bark of the tree, on the fruit of which they have been reared. They are also often taken into the cellar or fruit rooms before they leave the apples, and after they crawl out conceal themselves under the hoops of barrels or in the cracks of bins, where the careful observer frequently finds and may destroy them.

As the spring opens, the worms, which are hidden in crevices, change to chrysalis and from that immerge perfect moths, ready for the work of destruction. They first appear soon after the trees blossom, and proceed at once to deposit their eggs, one at a time, in the calix end of the newly formed apple. In about one week there hatches from the egg thus deposited a small, white worm, with shiny black head and neck. As they become larger the body is a flesh color with the head and neck tawny, and when fully grown they are nearly half an inch in length. As soon as hatched the little worms immediately begin to burrow in the apple, eating their way from the eye to the core and through the apple in various directions. To get rid of the refuse fragments of the food it enlarges the hole of the entrance, or gnaws one through the side of the apple, and thrusts them out of the opening. The growth is completed in three or four weeks, when the insect allows the apple to complete its transformation; this is usually when the apples are less than half grown, at which time most of the infested fruit falls to the ground. Now the worms leave the apple whether fallen or not and creep into the chinks of the trees, or other sheltered places, which they hollow out with their teeth to suit their shape. Here each one spins for itself a cocoon or silken case, and unlike the other brood, change into chrysalis immediately after their cocoons are made and turn into moths. In about two weeks they come out and lay their eggs for a second generation and it is this generation that causes so much worm eaten fruit in the autumn. This is the brood that hibernates through the winter in the larva state and comes forth moths in early summer to deposit the eggs for the first brood. We have necessarily been brief in our history and description in order to sooner get to the practical remedies, all of which are simple and easily applied.

REMEDIES.

First is destroying the insects in their winter quarters. Second, picking the wormy apples from the trees and destroying them. Third, gathering the wormy apples from the ground or letting swine and sheep have the range of the orchard. Fourth, entrapping the worms in bands or other contrivances.

When we consider that every female moth is capable of laying many more eggs and that every worm of the first brood totally ruins an apple, we will readily see the importance of destroying the insects before they leave their winter quarters. For this purpose the careful orchardist will carefully search every crevice where there instinct would lead them to conceal themselves during the winter. We will hunt for their cocoons under the bark and in the crevices of trees and also in the hoops of barrels and in the cracks of bins in which fall and winter apples are kept. I have seen the pieces of barrel heads and the ends of bins that were laid on top of each other, so completely glued together by the worms between them that a number could be raised together by taking hold of the top one.

The young worms, soon after the apple begins to grow, come out casting through the hole they made in entering, or through a hole made in the side of the apple for the purpose, and a portion adheres to the rough shriveled calyx, their presence is easily detected. All of those within reach may be plucked by hand and the remainder by means of a wire hook attached to a string. The tree may first be jarred when many of them will fall and may be caught on sheets spread beneath, and then go to the tree and remove the remainder. The fruit thus remaining should of course be fed to swine or burned, and if the method is thoroughly done there will be but few left to propagate the second brood. Third, gathering the windfalls from the orchard or letting the swine and sheep have the range of the orchard. By the latter the fruit will be utilized, but it is not as good as the other because many of the worms escape before the fruit falls. Fourth, entrapping the worms under bands and other contrivances. The well-known habit of the Codling Worms of seeking shelter, when about to transform into perfect insects under the scales or bark upon the trees where they have been feeding, has suggested the idea of entrapping them under some artificial covers, and experience has proven that by following this method, in connection with the others, they can be nearly

exterminated. Paper bands are probably the cheapest in large orchards, although bands of hay, rags or other substances may answer. The paper bands are made and applied as follows: Sheets of straw wrapping paper, say 18x30 inches, each sheet folded twice, giving eight layers between two and three inches wide. One of these are folded about every tree between the ground and the lower limbs, and fastened in place by a carpet tack. The band should completely encircle the tree, the lower edge being loose enough to permit the worms to crawl under. The object is to furnish the worms a hiding place which they will accept to undergo their transformation. The bands should be put on about the first of June, or before any worms escape from the fruit, and kept on until October. But to be effectual they will require taking off and destroying such insects as have taken refuge under them every few days. The better way is to burn the bands and replace them with new ones, but if they are made of manilla paper, such as is used for flour sacks, they may be run through a clothes wringer, and replaced, and will ordinarily last one season. Where but a few trees are to be protected it might be economy to use cloth bands and at each examination to dip them into boiling water to kill the worms taken off, and lay away when the season is over and they would last many years. Another safeguard against them is to remove all worthless varieties of fruit trees from the orchard.

Many of our farmers have planted largely of Siberians and hybrids that no longer pay for gathering and marketing. The fruit is allowed to remain where it falls upon the ground to decay and form a hot bed for the propagation of various insects and the breeding place of blight and fungus. While such remain, not much headway can be made in fighting the insects upon the trees producing valuable fruit. Lastly, protect and encourage the presence of insectivorous birds. The keen eye of the downy woodpecker will detect the larvæ in its most secret hiding places and the sharp bill is prompt to bring forth the dainty morsel. The blue jay, blue bird, wren, and many others, are always ready to lend the fruit grower a helping hand.

FROM SECRETARY HILLMAN.

The following letter from S. D. Hillman, Secretary of the State Horticultural Society, was read by President Sias :

A. W. Sias, President Olmsted County Horticultural Society:

DEAR SIR:— Your favor of recent date inviting me to be present at your annual meeting is received. I hasten to reply, and regret that a press of other duties will preclude the possibility of meeting with you on the occasion mentioned.

I trust you will call attention to the near approach of our annual meeting, and will extend to the members of your local society a cordial invitation to attend the same and participate in the discussions and deliberations. I have no doubt that some matters of more than usual interest to horticulturists will be presented.

One of the most timely subjects to be discussed and properly considered at this time, is the method to be employed to secure hardy varieties of fruit trees for Minnesota and the Northwest. Our severe winters have had the effect of thinning out our orchards and nurseries, till there are very few varieties left that can be relied upon with any satisfaction or degree of certainty to produce a crop of fruit.

It is undoubtedly true that too little care has been exercised with regard to the selection of hardy, vigorous stock and the kinds that mature and ripen their wood early in the season, and of late the question of how to obtain some of the better Russian varieties of apples has been a prominent subject at our meetings. Experience has demonstrated the great value of many of these sorts which have been propagated to some extent in this State and in states adjoining. The experiments being made will surely result in the bringing out of a few varieties, sooner or later, of equal value with the well-known Duchess, so universally popular with the farmers of the Northwest. By means of judicious crossing with our native seedlings there will be an improvement in the quality of the varieties to be produced.

Of late a method of crossing has been introduced with success by using the pollen on such hardy winter trees as may be found among our native sorts and fertilizing, or crossing, with such Russian varieties as the Hybernal, Lieby, Ostrekoff Glass, or other true ironclads. It is found that the pollen may be even sent in a letter, and after being kept for several days will germinate. By using such means to obtain a stock of required hardiness the crossed seedling will generally be found to follow the characteristics of the parent tree. The method is receiving attention from the fact that it is desirable to obtain choice winter apples of proper hardiness for this climate, and as being consid-

ered a shorter road to success than experimenting with our seedlings and them alone.

The matter of growing grapes successfully here in Minnesota is attracting some attention of late, and should receive greater consideration at the hands of farmers generally. There has heretofore been too little interest manifested in this direction. I have on my table a letter from T. T. Lyon, president of the Michigan State Horticultural Society, in which he says: "I was greatly interested, not to say surprised, in looking over the exhibits of fruit from your State at the New Orleans exposition, and especially to see among them well-ripened Catawbas—a variety whose home proper is in the Ohio Valley, and which we in Southern Michigan only ripen with certainty in our more favorable localities."

I may say here that in visiting the celebrated vineyards near Cleveland, last fall, on the shores of Lake Erie, that the Catawba, which is quite a favorite with many, was not very much advanced in its stage of ripening to that to be observed on the shores of our own Minnetonka lake. It was evident that we could produce the Concord, Moore's Early and Delaware even with equal certainty in our favorable localities.

Your experience in Olmsted county will bear me out in the assertion that there is hardly a better county in the State for fruit culture, and I am glad to know that your society there is still interested in advancing the horticultural interests of the county as well as the State at large.

Please send us a good delegation to our annual meeting. With sincere wishes for your prosperity and begging to be excused for this hasty note, I remain, very respectfully,

S. D. HILLMAN, *Sec'y.*

DISCUSSION.

Mr. Wayland Stedman inquired concerning the paper of Mr. Harris, if the larvæ of the moth when concealed under the bark of the tree, could not be killed by the application of some wash.

Mr. Sias said he thought spraying the tree with Paris green was the quickest way of exterminating the pests, and agreed with Mr. Harris in the statement that insectivorous birds should be encouraged to remain around the orchard as they are of great aid to the fruit grower. He thought the best time to spray with Paris green was just after the blossom had fallen.

Mr. M. J. Hoag, who has been for the past three or four weeks in the South, gave a short description of the country. He said he found good soil for fruit growing, it being a sort of clay loam. It was much firmer than ours, the native soil being very hard. They could not raise grapes there to compete with those of California growing, but they were about the same quality as ours. He never saw fruit trees grow so rapidly. He measured a pear tree that had grown nine feet three inches in three years. About fifty per cent grow from cuttings. Their water was not considered safe for drinking purposes unless boiled, and the majority drink cistern water.

He also gave a short description of the people and their appearance with regard to health, and also the cattle and the effect of water and climate on them.

Mr. Hoag said, in regard to his experience in fruit growing, that he started a few raspberry vines last year. He had covered about half of them this fall. He said that he believed vines should be covered in such a severe climate as ours. He didn't believe in clipping them if they were to be covered, as it stiffened them and they were liable to break when bent. He never saw any blackberry vines that would live here unless covered.

Mr. I. D. Swain said that he didn't think it was a good plan to bend the vines. He lost more vines that way than he gained berries.

Mr. Sias said he used a potato fork in covering and finds it the best, as one man can handle the vines. He thought the vines of most varieties needed shelter.

Mr. Swain said there was little difference between thorough cultivation and mulching, mulching keeping the land cool, which is what the vines want.

Mr. Sias said that on some soils it was unnecessary to manure heavily.

Mr. Stedman said blueberries grew here wild about thirty years ago, and he thought they could be grown here now.

Mr. Sias said he saw some bushes at the head of Bear creek and he had planted a few in his garden and they bore well. He believed they could be cultivated.

We insert here the address of President Cutler, at the annual meeting of the McLeod County society.

PRESIDENT'S ANNUAL ADDRESS.

By M. Cutler, Sumter.

Members of the McLeod County Horticultural Society:

It gives me pleasure to meet with you again, and my greatest desire is that this may prove a profitable and interesting meeting to all present, and that something may be done here today that will cause others to take an interest in our society as well as horticultural work for the health and happiness of their families.

While we have not as many members as we should like to have, we must remember that small beginnings often produce great results. We have as many members as the State Society had during the first year of its existence. Still it is a great success, and each year, through its members and instructive reports, exerts an influence for good that cannot be counted in dollars and cents. A large part of our people have migrated from lands that produce apples and other fruits in abundance and there is a longing desire to gather fruit from their own vine and tree. How intense that desire is, is best shown by the readiness with which they have parted with their hard-earned dollars when the tree agent has appeared with his beautiful pictures and nice stories of hardy fruits adapted to our climate, thereby inspiring hopes to be blighted with the first blasts of winter.

The history of fruit growing in McLeod county presents a dark and dismal record. Enough money has been worse than wasted to make several fair fortunes, but we hope a better day is coming. The perseverance of such men as Gideon, Tuttle and a score of others will, in a few years, solve the apple problem, and our list of small fruits is being rapidly extended so that we see no reason to doubt the realization of the hopes of these old pioneers who have predicted that Minnesota would become as famous for her fine fruits as for fine wheat. Let it be the object of our society to inform the people of the merits of these new fruits and warn them of the danger and risk in giving their money to oily tongued strangers. With your permission I will offer a few suggestions.

I think a committee should be appointed to attend the annual meeting of the County Agricultural Society and if said society will agree to banish fakirs, fortune wheels and all similar

schemes that rob and demoralize the people, make arrangements with them to have liberal premiums offered for horticultural products and make a joint exhibition. Such an arrangement has met with success in some places, and I think would in this county. Some plan should be devised for getting more members and getting the reports of the State Society now on hand among the people. I therefore suggest that the next meeting be held at Hutchinson some time during the winter. If we wish to have a live society we must be full of enthusiasm. One or two can not make of this a successful society, but each must do well his allotted task. I believe that when the people know what to plant and how to care for them, the finest of small fruits will be found in nearly every garden in the county. If one man can grow one hundred and twenty-five bushels of strawberries per acre, as was done by a farmer near Winsted the past season, certainly others should be able to grow enough for their own use. A few years since a cultivated berry was seldom seen in our home markets. Now, as soon as spring opens, they begin to arrive from the south and continue to come until about the middle of June when our own producers furnish an ample supply. Tastes are rapidly changing and the old time pork diet is giving way to the beautiful and delicious fruits. We have the soil and climate for the production of the most highly colored and best flavored fruits grown, as soon as we solve the question what to grow. Then, fellow members, let us hope that this meeting is only a forerunner of many more to follow and that from our deliberations great good may come to the people of this county.

FRUIT REPORT FROM WISCONSIN.

MENOMONIE, DUNN COUNTY, WIS., MAR. 22, 1887.

S. D. Hillman, Secretary, etc.:

Dear Sir: Thinking that a report of trees, etc., from this section might be of interest, I will state the following:

We did not have a very trying winter this year, although the thermometer sank down to 40° and under and remained there for about a week, but that is less than usual for three years. I have just come in from examining the trees and I find the following, which I have growing in the nursery row, to be entirely hardy: Lou, Florence, October, Martha (received from Peter M. Gideon, Minnesota,) Whitney, Hibernial, Ostrokoff's Glass and

Hyslop, Transcendent and Moringe Crabs. Then follow Duchess, Tetofsky, Pringle, Gilman, Dean, Yellow Anis, Charlamoff and Repka Malenka, with the terminal bud and an inch of wood slightly discolored. Next come Isham, Peach, Charlottenthaler, Yellow Transparent, Prolific Sweet, McMahon White, Scott's Red and Iowa Russet, with a trifling more discoloring. Then come Iowa Blush, Wealthy, Alexander, Longfield, Child's and Switzer, with yet more discoloring. Last come Borsdorf, Wolf River, Walbridge, Fameuse, Plumb's Cider, St. Lawrence and Fall Orange — all of which I think are no good here.

I have also Clapp's Favorite, Flemish Beauty and Keifer Hybrid pears growing in nursery row, all of which are frozen to the line where covered by snow last winter. One Keifer Hybrid pear, three years old (from Chas. A. Green, Rochester, N. Y.) that has been drifted up with snow every winter, made a splendid growth last summer and set fruit buds to every inch of wood. Last fall I took two big barrels, with ends knocked out, and placed them around it — one barrel on top of the other — filled in and covered with sawdust. That tree has come out sound, and I expect to have some pears from it next summer.

The native plums received from Mr. Gideon made a very fine growth and are entirely hardy. Moore's Arctic plums, from Phoenix Nursery, Delavan, Wis., seem to have stood the winter fairly well.

Strawberries and currants grow finely here. Raspberries and blackberries must be covered every winter, then they fruit well and pay well.

Very little fruit is grown here, but the market, in season, is well supplied with wild fruit. Besides some strawberries and currants, a few Duchess apples, Hyslop and Transcendent crabs are seen. But as the country becomes settled, the wild fruit will go, the demand for cultivated will increase year by year and by that time, I think, we will have solved the problem of successful fruit growing in the far Northwest.

Yours for further trial to grow fruit,
S. RUNNING.

FRUIT GROWING IN THE NORTHWEST.

[A paper read at the meeting of the American Horticultural Society, at Cleveland, Ohio, September 7th to 11th, inclusive, prepared by J. S. Harris, of La Crescent, Minnesota.]

Mr. President and Gentlemen of the American Horticultural Society:

The duties devolving upon me as a member of the State Board of Agriculture of Minnesota, and the fatigue I feel from the laborious work attendant upon our fair just closed, lead me to regret that I have promised a paper for this occasion, and will deprive me of the pleasure of meeting with you.

I can not give you a carefully prepared paper upon the subject your secretary has assigned to me. The Northwest has gradually receded before the march of civilization until it is now known as the region embraced in the states of Wisconsin, Minnesota, Northern Iowa, Dakota, and Montana; but it is still an empire in extent, the fairest land the sun shines upon, and there is no other section of this great country that to-day offers such unsurpassed inducements to the farmer, mechanic, merchant, professional man, and all others seeking new homes, to come and settle within her borders. The climate is stimulating, and well calculated to bring men and animals to their greatest state of perfection; the waters are as pure and as abundant as in any inhabited country upon the globe; the soil is unequalled in variety, fertility and natural adaptation to the growing, in its greatest perfection, almost every fruit, vegetable and cereal required for the sustenance of civilized man, and it possesses a purity of atmosphere that promotes health and vigor to man and the products of the soil. Within its borders are found forests of valuable timber, vast prairies ready for the plow of the husbandman, and deposits of the richest minerals. These peculiar advantages have brought within its borders a pioneer people composed of the most intelligent and progressive from every land, and the development of its resources is marvelous. A history of its horticulture, which is trying to keep pace with other industries, would read like a romance; would tell of struggles and trials, failures and triumphs, of men who had nerve and hope enough to enable them to plant trees in opposition to public opinion and in the face of the difficulties attendant upon the settlement of a new country, and in the face of almost certain disaster. Fortunately a few of these early pioneers, scattered here and there, were of a class who persisted in planting trees,

making experiments and hanging on to a forlorn hope, until they have gained the confidence of the multitudes and are now regarded as heroes in horticulture.

THE PAST OF HORTICULTURE.

The first planting of trees and fruits by the early settlers of this country was of such varieties as were favorites in their former homes. The planters had but an imperfect knowledge of the soil and climate of the country, and the hardiness and adaptability of varieties; for a few years a great number of varieties succeeded so well as to raise fond hopes that this was destined to be a country well adapted to the production of apples, pears, and all hardy fruits, and orchards were being extensively planted with the most tender varieties. Right upon this hopeful period occurred a fearful disaster; the winter of 1872-3 destroyed trees by thousands, and totally annihilated hundreds of orchards of the old favorite varieties. Investigation proved the cause to be root-killing, resulting from a severe and protracted drought which had prevailed in the fall. The ground froze up dry, and the absence of snow caused it to freeze to a great depth, consequently all moisture was drawn from the roots. A few varieties survived this test (one not likely to come again in an ordinary lifetime), and they were considered to be "ironclads" and formed the basis of replanting and starting new orchards.

Ten or twelve years of remarkable success followed this great disaster, and a new impetus was given to the planting of such varieties as had survived the severe test, and in looking about for others of equal hardiness, and to the originating of new varieties from seed, when in the winter of 1884-5 a disaster as great as the first overtook us. The conditions of the latter were in many respects directly opposite from the first. A summer drought and early frost had matured the growth of the trees. September, October and half of November were wet and very warm, starting a new growth. Winter shut down suddenly, was long and severe, and the deep snows prevented freezing of the ground. The opening of spring found the tops and trunks of many varieties killed to the ground.

THE PRESENT.

Not yet discouraged our people are turning past failures to profit. Improved varieties of the Siberians, several varieties of

home seedlings, and many varieties of Russian origin stood this severe test with little or no injury, and there has been no time in the past when more interest has been manifested in fruit growing. Our horticultural societies are gaining in strength and usefulness; our orchards are being reset and extended; but only such varieties are being used as have proven to be early and abundant bearers and reasonably hardy, while extensive experiments are being made with newer varieties imported from Russia, and in originating varieties.

At the Minnesota state fair just held the horticultural display was one of the best ever made in the Northwest. It included nearly one hundred varieties of large and fine apples, several improved Siberians, some thirty varieties of the best American grapes, and several of native plums.

THE FUTURE.

The future is hopeful. There is not a reasonable doubt but that some of the varieties recently introduced from Russia, by Messrs. Budd, of Iowa, and Gibb, of Canada, will prove adapted to all parts of this great country, and it is believed that seedlings from them, developed in our soil and climate, will be adapted to our wants and produce fruits of great excellence, which, together with the improvement being made in the Siberian species by Peter M. Gideon (the originator of the Wealthy apple), by crossing and hybridizing with the larger apples, will soon give us an enviable reputation for the abundance of its strawberries, raspberries and grapes. The strawberry is at home here, and is largely grown for home use and for market. The most popular varieties are Wilson, Crescent, Downer and Glendale. These are usually grown in matted rows and the beds continued from two to three years. Marketing is cheaply done in quart boxes shipped in sixteen and twenty-four-quart crates. Prices range from five to fifteen cents per quart, according to season and quality.

The varieties of raspberries most extensively cultivated are Doolittle and Seneca, for blackcaps; and Turner, Philadelphia and Cuthbert for red. Some winter protection is usually given. The yield is generally abundant and the crop sure.

When winter protection is given, blackberries are found to do well and are a very profitable crop. The varieties are Snyder and Ancient Briton. Currants and gooseberries are at home

here. The cultivation of native grapes is now attracting considerable attention, and all varieties that will ripen early enough to escape the autumn frosts produce the most perfect fruit that can be found in the Union. The varieties most extensively grown are Concord, Delaware and Worden. Many others are doing equally well and the future of grape culture is very promising.

Among the fruits indigenous to this region there are none giving a promise of greater possibilities than the Canada plum (*Prunus Americana*). Several varieties, as the DeSoto, Rollingstone, Cheney, Forest Garden, and Weaver, have taken their places among our popular fruits, and steps are being taken to ameliorate and improve them by cultivation and selection of seedlings.

Floriculture is receiving its share of attention, and the displays of flowers and plants at our state and other fairs could hardly be excelled by those of the older states. No country in the world of like extent surpasses this in the quality and quantity of its vegetables with which all our markets are abundantly supplied.

From Farm, Stock and Home.

HORTICULTURE AT THE SOUTHERN MINNESOTA FAIR.

Rochester will always hold a prominent place in the history of horticulture in Minnesota. It was here, at the state fair in the fall of 1866, that the first exhibit of the larger apples was ever made at any state fair in the State. The principal exhibitors on that occasion were J. W. Rollins, of Elgin, and J. S. Harris, of La Crescent; Rollins showing 6 or 8 varieties and Harris 18, all of their own growing in the State. At that memorable fair the State Horticultural Society was first organized, with but twelve members, and has not only continued its existence down to the present time but has increased in numbers, strength and usefulness until it now has over two hundred earnest, working members, and ranks as one of the first and best societies in the Northwest. But three of the original members were present this year, A. W. Sias, J. W. Rollins and J. S. Harris. Mr. Cotterell would have been present but for sickness. The wonderful growth of the Society and the advance in horticulture, as shown by the exhibits, was very gratifying to these old pioneers, and

repays them well for the twenty years spent in working for the advancement of the Society.

This fair has a magnitude second only to the state fair. In most departments the exhibits were full and good. The fruit department was attractive, instructive, and only lacked the Minnetonka grapes to make it excel that of the late state fair. The leading exhibitor was A. W. Sias, who made an entry for a general display and showed a great variety of American, Russian and hybrids, securing the first prize as a professional. William Somerville, of Viola, had a general display of winter and autumn varieties and a large collection of Siberians and hybrids. He took the first prize on general collection as an amateur. His collection had in it several fine varieties of Russians and a few of the Rollins seedlings. His orchard has fruited abundantly this year and we are informed that he has already marketed four hundred bushels. Next came Sidney Corp, of Hammond, and every entry he made took a prize, every ribbon blue but one, and it only lacked three varieties in the collection to decorate that with the same popular color. He showed the largest and best Wealthies ever grown in this or any other state; had several plates of McMahan's White, a seedling from Richmond County, Wisconsin. This fruit is very large, perfect in form, of pleasing appearance, season said to be December or January. This apple stood the winter of 1884-5 about as well as the Duchess, and promises to be well adapted to Southeastern Minnesota. Mr. C. also showed some varieties of the Rollins seedlings and a few of the Russians, one of which, the Autumn Streaked, promises to be a valuable variety, its season closely following the Duchess. Twenty years ago Mr. Corp could show nothing better than Siberian crabs. R. L. Cotterell, of Dover Centre, showed a great variety of apples and grapes. J. W. Hart, of the same place, had a collection of seedlings, two of which are remarkably fine. Wm. McHenry, of St. Charles, had a general exhibit of apples and plums; of the latter there were seven or eight varieties, most conspicuous among them a variety named the Weaver, a free-stone of excellent quality. W. O. Crittendon, of Dover Centre, had a large display, mostly hybrids; and a farmer from Viola made a splendid showing of Wealthy, Duchess and Hybrids. O. M. Lord, of Minnesota City, showed ten varieties of cultivated native plums in glass jars; conspicuous among them was the Rollingsstone. There were four or five exhibitors of grapes, and several of single plates of fruit, whose names we did not learn.

The show of flowers and ornamental plants was fine and chiefly made by Mrs. Nesbet, of Rochester, John Wonder, and Smith & Darling, of Winona. The display of vegetables was much better than at the state fair, and the first prizes were sharply contested for. The great variety and superior quality of the corn exhibit would convince the most skeptical that this has been a remarkable corn year, and that this country is peculiarly adapted to perfecting this valuable grain.

J. S. H.

LA CRESCENT, MINN.

RUSSIAN APPLES.

Wm. Toole, one of the substantial farmers of Sauk county, Wis., writing to *The Farmer*, St. Paul, on the subject of "Russian Apples," says:

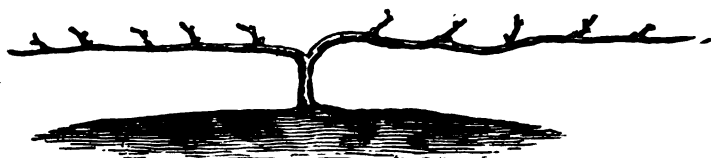
In the Russian orchard of A. G. Tuttle, Baraboo, Wisconsin, there are more than eighty varieties set apart by themselves, and the greater part are now bearing. We have dropped the term "Ironclad" in this part of the world, and hardy as the Duchess is now our degree of comparison, though hardy as the Wealthy, if proved, is enough to make a variety acceptable here on the scale of hardiness. That Mr. Tuttle has dozens of varieties here as hardy as the Duchess, no one can doubt after seeing the healthy foliage, smooth, glossy trunks, and making comparison on the same grounds with all of the leading ironclads in various stages of age and growth. Mr. Tuttle said that he would have been well satisfied to have found amongst them a dozen varieties worthy of keeping, but there are so many good ones that it would be difficult to cut down the list of best to less than twice that number. While we were passing through the orchard, some notes of varieties were jotted down at random as follows:

Lord's Apple or Arabsko, a great bearer, fine showy apple, good quality, will keep till May. Glass Green, a late Duchess, very handsome tree, heavy bearer, but not as soon as Duchess to ripen. Lone Turnip, a sweet apple, ripe early in August. Lowland Raspberry, a medium sized, very handsome apple, the best of quality, ripens middle of August. Tetofsky, a very large showy apple ripening in autumn. Barloff, a sweet variety of good quality; early winter. Juicy White, not quite as early as Transparent, very juicy. Golden White, medium, large and hand-

some, good bearer, sub acid, keeps well into winter. Enormous, ripens middle of August, very large and showy and of fair quality. Omensk, first year bearing; evidently a good keeper and promises to be a heavy bearer. Vargle, quite large, green, pronounced by Gibb one of the best of winter Russians. Blue Anis; also four others of the Anis class, all early winter. Antonovka, a heavy bearing, long-keeping variety, of good quality. Early Champaign, a heavy bearer, red streaked, tart, juicy, mellow and sprightly, and is three weeks earlier than Red Astrachan. Hiberna, a heavy bearer, hardy and healthy; season from November to February; kept at New Orleans until spring. Switzer, juicy, fine grain, sub acid; it ripens in September and holds in season twice as long as Duchess. Zolatoref, very large and showy, sub acid, ripens in October. Zuzoff's Winter, an early winter variety of medium size and fit for use early in winter; it is very fine flavored. Longfield, one of the best; fair size, very hardy; it keeps longer and is better than Fameuse. Arabian, a late Duchess. Transparent, a clear, waxy, white-skinned apple, of good quality, juicy and very early. It is hardy, a constant and enormous bearer.

PRUNING AND PROTECTING GRAPE VINES.

The season for doing this work is in the fall. When the vines have shed their leaves, which happens after a few severe frosts about the first of November, a great amount of rough growth must be removed, to make thorough winter protection possible. This question about the manner of pruning is one embracing a great variety of notions, though none of serious dispute. The age and character of the vine has much to decide in the matter, also the location or section of country where grown. As a general thing, however, the purposes for which pruning is done are the same, the question being how it shall be done. Throughout the Northwest it is found necessary to protect grape vines in winter. The wood is light and porous, and through extreme changes in the weather it becomes dried out, and the vitality of the plant very much injured, when not entirely destroyed. Bending close to the ground has some effect of saving evaporation, but a slight covering of earth furnishes ample protection to all varieties found adapted to this climate. The plan of bending down makes it desirable to grow as little old wood as possible, hence the necessity of close pruning, which causes the fruit to grow on the line of one or two canes.



PRUNED READY TO COVER.

A vine that has been set only one season will consist of one cane from two to four feet in length, which should be cut back in the fall to about one foot, leaving about three joints above the surface of the ground. The second year but two canes should be allowed to grow from these buds, and again in autumn these should be shortened each about to eighteen inches, if they are vigorous, but if not they should be cut back close to the old wood and more new canes started the third year. Even the third year it is best to cut back well and allow little or no fruit to be grown until the fourth season, when a good foundation of roots has been secured. The productiveness of a vineyard depends more upon the amount of vigorous roots to the vines than anything else. When the vines have become well established, the pruning thereafter is done in a manner to secure the most fruit at the least expense of vigor to the growing plant. Taking it year after year close pruning will secure the largest quantity of fruit, and at the same time the highest quality. Old vines should be left to grow from four to six feet of old wood, and the laterals on this stem should be trimmed leaving only one or two vigorous buds on each one to produce the bearing shoots for the next year.

The training should be done on horizontal poles or wires, and the main stalks given an incline of about 45° so that bending down will be made easy when the time comes for covering. In a vineyard of considerable size the work of covering is made very much easier by first laying the vines down and throwing just enough earth over them to keep them in place, then take an ordinary stirring plow and throw a furrow on each side toward the row. In doing this it is necessary to use care not to plow too deeply or stir the ground very near the roots. The rest of the covering is done with a shovel, using the already loosened soil.— *The Farmer*, St. Paul.

STRAWBERRIES IN ILLINOIS.

Mr. Parker Earle, of Cobden, Ill., the strawberry king of that State, in writing to the secretary of the Michigan Horticultural Society, gives his method of culture in the following terse manner:

"Here is how we do it. We plant in the spring, and largely of Crescents, getting three rows of them to one of some fertilizing variety, as Sharpless or Sucker State. We cultivate clean all summer, in matted rows, keeping the rows entirely distinct. We mulch in the late autumn with wheat straw, covering the middles heavily and the rows lightly. Never take it off. Next: The tarnished plant bug ruins nearly ninety per cent of all varieties except Crescent, and sometimes half of them. We pick every day — seven days in the week. It is wicked to work so hard, but we can not harvest strawberries for shipment long distances without doing just this thing. We use quart boxes five inches square by two and a half inches deep, and twenty-four-quart crates. We don't use the Michigan box, which is nearly as deep as it is wide, and looks small and carries badly, and would not use them if furnished free. We don't use sixteen-quart cases, which are as high as wide, and which no fellow ever knows or cares how to set down, bottom, side, or top up. We don't use this package, and I wish you Michigan people would abandon such an ill-looking, bad package. Your berries would bring more money in our style of package and it costs no more. Finally, we ship in refrigerator cars, the berries being first carefully cooled off, and we use Tiffany cars, because they carry the ice overhead, where it ought to be. We scatter widely, and we don't make as much money as we want to, for there are too many strawberries for profit to the grower."

HOW TO EAT STRAWBERRIES.

By Chas. A. Greene, Rochester, N. Y.

The following directions on this topic are given by Mr. Greene, who handles the "Jessie," and who doubtless knows a good thing when he sees it:

First catch your strawberry. Don't catch her in your neighbor's garden while he is off fishing; don't catch her from

the strawberry man's wagon, when it happens to pass your way at long intervals; don't catch her at the grocery, soft, sticky and slippery. No! Catch the strawberry as it blushes in your own garden or field, fresh with the morning dew, fragrant and beautiful as the rose. Thus captured, you catch ruddy cheeks, a good appetite, love of home, fun for the children and long life. Don't catch her among weeds and grass, nor under the shade of trees, but in the open sunshine, whither she holds a picnic, and where she has a chance for life. While you are catching, catch a plenty. Catch enough for the young folks, the old folks, the servants, the sick neighbors.

Having caught the strawberry do not be rash. Most people are led by instinct to devour ravenously as soon as caught, but I advise you to be deliberate and thoughtful. Look the berries over. Note the form, color, texture, aroma. Take your brushes and paint a strawberry on canvas, then compare it with the original. The garden berry has beaten you, I daresay. Your painted berry has no soul, no heart. It does not look jolly or lead you off into reminiscences of early days; the sunshine does not adhere to it; it does not smell good; even the pigs would turn up their noses at it, and yet, you pride yourself upon being an artist.

Think for a moment of a plant that produced these berries. Its ancestors blossomed and made love on this continent before Columbus landed; Noah plucked a few on his way to the ark before the flood, sorrowing over the hour of parting; Moses fed upon them in the mountain of Palestine, after he last turned his face from the people he had led from bondage; Adam and Eve gathered them when they first awoke in the Garden of Eden.

While thinking, continue to inhale the perfume, and ere you stop, dash on a little sugar, and, as by accident, partially tip the cream pitcher over the berries. (It would be heartless to intentionally besmear creations so beautiful.)

I have now reached the end of my task and the beginning of yours. If from this point you do not know how to proceed, you are not a son of Adam, but a stranger from some far-off planet where it is too hot, frosty or weedy to produce strawberries."

ENTOMOLOGY IN ILLINOIS.

By C. M. Weed, Champaign, Ill.

I may be permitted to mention one or two of the practical results of investigations concerning economic entomology in Illinois. The farmers of the state had for some years been troubled by a worm that ate the roots of young corn, annually destroying great quantities and entailing a serious loss of time and labor. No successful remedy was known. The life history of the pest was studied by several of the leading entomologists of the state and it was discovered that the insect was the young or larvæ of a common green beetle (*Diabrotica longicarnis*, Say). It was also found that these beetles deposited their eggs in the soil of corn-fields in autumn, so that the following spring when the young larvæ hatch they are ready to attack the growing corn. From this it was an easy step to the suggestion that by an intelligent system of crop rotation, such as that of following corn with oats, the young worms would not have suitable food at hand, and being unable to escape from the environments of their birth must of necessity perish. Thus there was provided a simple, practical and inexpensive means of escaping from the ravages of a pest that had threatened to put a stop to the production of the chief cereal grown here; and to-day this idea has entered into the scheme of agricultural practice in the most successful farming communities of the state.

Another instance is also in point here. As doubtless all who listen to this paper are aware, the production of strawberries is one of the chief pursuits of the horticulturists of Southern Illinois. The business had been so long continued that a few years ago insects of various kinds had increased to such an extent as to seriously interfere with the successful production of fruit. The state entomologist was appealed to, and the whole subject was exhaustively studied a few years ago by Prof. Forbes and his assistants, the result being an elaborate paper upon the insects affecting the strawberry, which was read at the meeting of the Mississippi Valley Horticultural Society in 1883, being published in the transactions of the society for that year and also appearing in the thirteenth report of the state entomologist of Illinois. It was there recommended that to prevent the undue increase of injurious insects the old strawberry plantations be plowed up at such times as would kill the young of the worst of the pests by starvation, and that the plantations be frequently

renewed, rotating with other crops as much as possible. This, too, is now the ordinary horticultural practice in Southern Illinois.

RESOLUTIONS ON FORESTRY.

The American Forestry Congress, in the meeting held at Denver, Colorado, September, 1886, in behalf of the forestry interests of the country, adopted the following resolutions:

1. That the rapid destruction of the timber lands of this country is an evil which will result in incalculable damage to the present and future generations; that the denudation of mountain slopes and hillsides, by fire and axe, without proper regard for renewal, has already begun to injure agricultural interests by disturbing favorable distribution of water supply, intensifying droughts and floods, causing springs to become dry and streams to diminish their flow.

2. That the importance of maintaining a proper amount of land in forests can not be overestimated, and it is also apparent that only the government, state, or nation can have an interest in such maintenance for the benefit of future generations.

3. That the public lands, at the sources of streams, necessary for the preservation of the water supply, should be granted by the general government to the several states, to be held and kept by such states in perpetuity, for the public use, with a view to maintain a full supply of water in all rivers and streams.

4. That we recommend to the general government the creating of the office of commissioner of forestry, which office shall be filled by a man conversant with the interests of practical forestry, whose duty it shall be to see that the laws upon that subject are carried into effect.

5. That fire is the most destructive enemy of the forest, and that the most stringent regulations should be adopted by the national, state and territorial governments to prevent its outbreak and spread in timber lands.

6. That the general government be recommended to assist the agricultural colleges of the various states in the formation of tree planting and culture, and that all work and experiments in that direction should be under the general supervision of the commissioner of forestry, in case such an office should be created; otherwise to be under the supervision of the commissioner of agriculture.

7. That the principles of forestry and practice of tree planting should be taught in the public schools of this country.

8. That, in our opinion, the agricultural colleges of the various states should give special attention to propagation and cultivation of forest trees, and especially to the purpose of determining the most useful and robust varieties of timber for their respective states, and for the various portions thereof, and for the proper dissemination of the knowledge so obtained.

9. That to encourage the planting and propagation of forest trees, states and counties should provide for and allow an abatement of taxes proportioned to the extent and success of such planting.

10. That we most earnestly recommend to the governors of the various states that they urge upon the legislatures of their respective states the importance of the preservation of the forests where they already exist, and to urge and encourage such legislation as will promote the more general planting and cultivating of trees and forests.

11. That there should be no rigid ruling as to the varieties of timber to be planted or cultivated upon a "timber-culture" claim.

12. That the commissioner of agriculture be authorized by Congress to apply, in his discretion, such sum or sums as he may see fit, from the appropriation for the forestry division of his department for the encouragement of national and local forestry associations.

13. That it is the sense of this forestry congress that the legislatures of the states should provide for the establishment and maintenance of experimental timber-culture stations, to the end that there may be secured a knowledge of the highest adaptability of different varieties of timber to the different soils, and that the taxable wealth of the state may be increased to the material lessening of the rate of taxation.

EXPERIMENT STATION AT OWATONNA.

AN ACT TO ESTABLISH AN EXPERIMENTAL FRUIT, FOREST AND ORNAMENTAL TREE STATION.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. That an experimental station be and is hereby established on the State School Farm at Owatonna, in this State, for the purpose of producing new and valuable varieties of fruit trees, thoroughly testing promising varieties we now have, and securing reliable reports in regard to fruit, forest and ornamental trees best adapted to the State.

SEC. 2. That said station shall be under the general supervision of the board of regents of the State University, who shall, with the advice of the president and secretary of the State Horticultural Society, appoint a superintendent, who shall report to the board of regents as they may direct, and who shall report to the State Horticultural Society in person at each annual winter meeting thereof.

SEC. 3. That all products of said station shall be the exclusive property of the State, and all surplus shall be disposed of as the board of regents may direct.

SEC. 4. That said board of regents is hereby authorized to set apart and appropriate from any fund at their disposal for such

purposes, such sum as they may deem advisable, not exceeding one thousand (1,000) dollars per annum, for the total expenses of said station.

SEC. 5. That this act shall take effect and be in force from and after its passage.

THE LAW OF MINNESOTA ON FRUIT STEALING.

Chapter 35, General Laws 1867.

AN ACT FOR THE PROTECTION OF FRUIT AND ORNAMENTAL TREES, SHRUBS, VINES, AND VEGETABLE PRODUCTIONS.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. That if any person or persons in this State shall hereafter enter the inclosure of any person, without the leave or license of such owner, and pick, destroy, or carry away the fruit, or any portion thereof, of any apple, pear, peach, plum, grape, or other fruit tree, bush, or vine, or any vegetable products, such person shall be deemed guilty of a misdemeanor, and upon conviction thereof may be fined any sum not less than ten nor more than fifty dollars, and imprisoned in the county jail for any period not exceeding thirty days.

SEC. 2. That if any person or persons in this State shall willfully and maliciously, and without lawful authority, cut down, root up, sever, injure, peel, destroy or carry away, any fruit or ornamental tree, or shrub, cultivated root, plant or vine, of whatever kind, or any fruit or other vegetable production, standing, or growing on, or being attached to the land of another, or shall willfully, and without lawful authority, cut down, root up, destroy, or injure in any manner, or carry away any fruit or ornamental tree, plant, shrub, or vine, upon any street, lane, alley, public highway, or public grounds, in any city, town, or village in this State, such person or persons so offending shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not more than five hundred dollars, or by imprisonment in the county jail not exceeding three months, or both fine and imprisonment, at the discretion of the court having jurisdiction of the case, and shall, moreover, be liable in double the amount of damages to the party injured.

SEC. 3. The penalties incurred by violation of this act may

forced by indictment in any court having jurisdiction of misdemeanors in the county where the offense is committed, or he may be recovered in an action for debt before any justice of the peace of such county.

4. This act shall take effect and be in force from and after its passage.

Approved March 9, 1867.

SELLING NURSERY STOCK.

AN ACT TO PREVENT THE PRACTICE OF FRAUD BY TREE PEDDLERS AND COMMISSION MEN IN THE SALE OF NURSERY STOCK.

Enacted by the Legislature of the State of Minnesota :

SECTION 1. It shall be unlawful for any person, corporation or association, to sell or offer for sale any tree, plant, shrub or other thing not grown in the State of Minnesota without first filing with the secretary of state an affidavit setting forth his name, age, occupation and residence, and, if an agent, the name, occupation and residence of his principal, and a statement as to where the nursery stock aforesaid to be sold is to be grown, together with a bond to the State of Minnesota in the penal sum of two thousand (2,000) dollars conditional to save harmless any citizen of the State who shall be defrauded by any false or fraudulent representation as to place where such stock sold him by such person, corporation or association was grown, or as to its hardiness and climate; provided, that the bond aforesaid shall, where the principal is a resident of this State, be given by such principal and approved by the agent.

2. The secretary of state shall, on the full compliance with the foregoing provisions, give to the applicant aforesaid a certificate under his official seal, setting forth in detail the facts showing a full compliance by said applicant with the provisions of this act, and said applicant shall exhibit the same or a certified copy thereof to any person to whom stock is offered for sale.

3. Any person, whether in the capacity of principal or agent, who shall sell or offer for sale any foreign grown nursery stock within this State, shall furnish to the purchaser of such stock a duplicate order, with a contract specifying that such stock is true to name and as represented.

SEC. 4. Any person, whether in the capacity of principal or agent, who shall sell or offer for sale any foreign grown nursery stock within this State, without complying with the requirements of this act, or shall refuse to exhibit the certificate mentioned in section two (2) of this act, whenever demanded, or shall by means of any advertisement, circular, notice or statement, printed or written, published or posted, or circulated by the agency of an officer, agent or other person, or by any other means shall falsely represent to any person, or to the public, that said nursery stock is grown in this State, and is hardy and adapted to this climate, shall be deemed guilty of a misdemeanor, and upon conviction thereof by any court of competent jurisdiction, shall be punished by fine of not less than twenty-five (25) nor exceeding one hundred (100) dollars, or by imprisonment in the county jail for a term not less than ten (10) nor more than sixty (60) days, in the discretion of the court, and shall be liable to the party injured in a civil action for treble the amount of damages sustained, and such party in such civil action may sue in his own name on said bond for the amount of such damages.

SEC. 5. This act shall take effect and be in force from and after its passage.

Approved March 8, 1887.

CONSTRUCTION OF THE ACT.

The following opinion of Attorney General Clapp will be of interest:

ST. PAUL, MAR. 31, 1887.

Hon. H. Mattson, Secretary of State.

DEAR SIR: In regard to the bond to be given under the act commonly known as the Tree Peddler's Act, I am of the opinion that where the principal is a resident of this State he can give one bond on behalf of his agents. The bond should specify the agent in whose behalf it is given. I think it would be an unnecessary hardship to require an additional bond, or a separate bond, for each agent which the principal may employ; and a bond of \$2,000, in connection with the penal clause of this law, would doubtless be ample protection.

In regard to the surety upon the bond, there should in all cases be at least one surety, and whether you will require more than one will depend upon whether, in your judgment, the principal and one surety offered render the bond perfectly good.

I have the honor to be

Very respectfully yours,

MOSES E. CLAPP,

Attorney General.

H. A. Johns, of the Sioux City Nursery and Seed Co., writing from Sioux City, Iowa, under date of Mar. 30, 1887, to the Secretary of State inreference to the requirements of the act, says: "I desire you to call the attention of the Attorney General to the fact that we sell direct to the farmers in the nursery business the same as we do the Minnesota merchants in the seed business, and all parties who sell are simply working for us direct, and I feel confident that with as liberal a ruling as he can make will conduce to all conforming to the requirements of the law. As we, and not our hired men, are the responsible parties, I think if we give bond and furnish to each man a copy, it will be right and save us a great inconvenience."

This letter being referred to Attorney General Clapp, elicits the following reply:

ATTORNEY GENERAL'S OFFICE,
St. Paul, Minn., April 1, 1887. }

Hon. H. Mattson, Secretary of State.

DEAR SIR: The communication of H. A. Johns, treasurer of Sioux City Nursery Co., received. I do not see how I can give the construction asked for. While the law may be oppressive, and I would be inclined to mitigate its severity by liberal construction, still I can not ignore the plain language of the law.

If the company employs persons in this State to sell their stock, such persons are the agents of the company and must each give the bond required.

It is true that the company is the responsible party, and had the law-making power been content to take that view, it would have been sufficient. Officers whose duty it is to administer the law cannot assume to say what would have been sufficient as a law, but must take the law as the law-making power has left it.

His name is.....
 His age is.....years.
 His occupation is.....
 His residence is.....
 The nursery stock which he designs to sell in the State of Minnesota is
 the.....
 The affiant says not, except that this affidavit is made for the purpose of
 affiant to sell nursery stock in this State which was not grown therein,
 pursuant to the provisions of An Act, approved March 8th, 1887,
 "An act to prevent the practice of fraud by tree peddlers and com-
 men in the sale of nursery stock."

Subscribed and sworn to before me this.....
 day ofA. D. 188.....

All Men by these Presents, That we,.....
, as Principal, and.....
, as Sureties, are held and firmly bound unto
 of Minnesota in the sum of Two Thousand Dollars (\$2,000), lawful
 the United States, to the payment of which, well and truly to be
 bind ourselves, and each of us, and each of our heirs, executors,
 ators and assigns, jointly and severally, firmly by these presents.
 with our seals, and dated this.....day of
A. D. 18.....

Addition of the above obligation is such, that whereas the above
,
 engage, pursuant to the provisions of Chapter.....of the General
 D. one thousand eight hundred and eighty seven,.....
,
 business of selling and offering to sell nursery stock in the State of
 , which said stock was not grown therein;
 therefore, if the above bounden
,
 and preserve all the provisions of said chapter.....in the prose-
 is said business within this State, and shall not defraud any citizen

of this State by any false or fraudulent representations made by.....
agents to such citizen, as to place where any such stock sold by...
 to said citizen, was grown, as to its hardiness for culture, then the
 obligation to be void, otherwise to remain in full force and effect.

Signed, Sealed and Delivered in the Presence of }
 }
 }
 (PRINCIPAL.)

To all to whom these Presents shall come, Greeting :

I,.....Secretary of State of the State of
 nesota, hereby certify, that in accordance with the provisions of Chapter
 of the General Laws A. D. 1887, of said State, one.....
 did, on the.....day of.....18....., file with me an an aff
 made in due form, wherein it is set forth, among other things, that a
 true name is.....; that his age is.....years; t
 occupation he is a; that his place of residence is.....
 and that the nursery stock to be sold by him in this State is grown at....
 in the state of.....

I further certify that said.....did, at the time of filing sa
 davit with me, also file, in the same manner, a good and sufficient bond
 forming in all respects to the requirements of the said Chapter....., h
 before referred to.

Given under my hand and official seal, this.....day of.....
 18.....

.....
 Secretary of State

[L. S.]

(AGENT.)

To all to whom these Presents shall come, Greeting :

I,.....Secretary of State of the State of Minnesota, h
 certify, that in accordance with the provisions of Chapter.....of the G
 Laws A. D. 1887, of said State, one.....did, on the.....
18....., file with me an affidavit, made in due form, wherein
 set forth, among other things, that the affiant is the agent of one
 that said principal's age is.....years; that his place of residence.....

occupation he is a.....; and that the nursery stock to be sold by
.....as the agent of said..... in this State, is grown at
.....in the state of.....

her certify, that said.....did, at the time of filing said affida-
me, also file, in the same manner, a good and sufficient bond, con-
a all respects to the requirements of the said Chapter....., hereinbe-
red to.

a under my hand and seal, this.....day of.....A. D. 18.....

.....
Secretary of State.

S OF SOUTHWESTERN WISCONSIN AND SOUTH- EASTERN MINNESOTA.

CONTRIBUTION TO THE LOCAL FLORA OF LA CROSSE AND VICINITY.

By L. H. Pammel, St. Louis, Mo.

term "weed" is used somewhat loosely, and often plants
re not troublesome are called weeds, and on the other hand
plants which are showy are not (among the laity, at
onsidered weeds, such as the common Corn Poppy, of *Eup-*
paver rhæas. But any plant growing persistently where
wanted may be looked upon as a weed. One of the best
ons, and the one now generally accepted, is a "plant out
." This definition includes everything which can pos-
called a weed, whether showy or not. The greater num-
weeds do not have showy flowers, a few exceptions are
tard, thistles, etc.

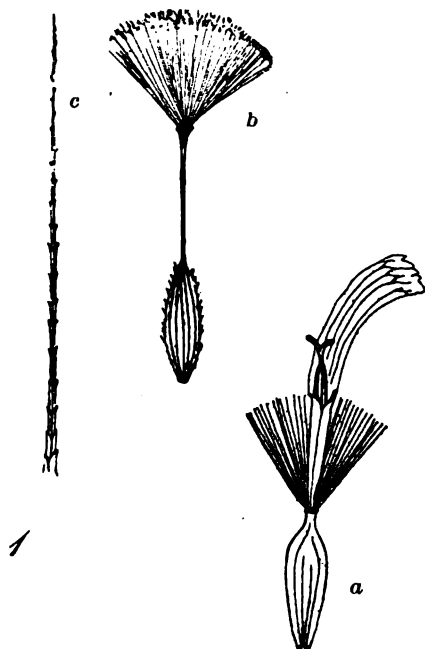
PROLIFICACY OF WEEDS.

Following figures are from Prof. W. R. Lazenby. (1) In
arsnips the number of seeds per plant were from 4,834 to
A rather large plant of Curled Dock (*Rumex crispus*),
Shepherd's Purse (*Capsella bursa pastoris*), 62,500 to
The Burdock (*Arctium lappa*), had, the second year of
tence, 400,328. A single plant of Foxtail Grass (*Setaria*

glauca) had 19,499 seeds (fruits.) Green Foxtail Grass, 46, Hedge Mustard (*Sisymbrium officinale*), 36,685; Wild Mustard (*Sinapsis nigra*, L), 131,574. Common Plantain, 43,569.

VITALITY OF THE SEEDS OF WEEDS.

Seeds may retain their vitality for years, if not exposed to the air, and properly matured. Girardin sprouted beans



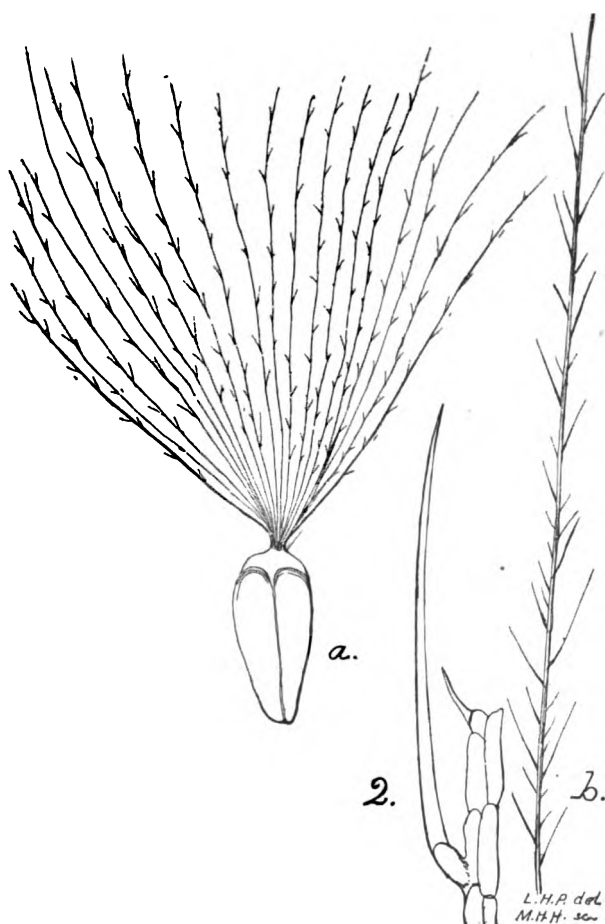
Lactuca scariola. a. Single floret in the pappus and ceruela, the Stamens united about the Style and the Stigmas protruding. Achenium with long beak and pappus b. attached to its end. c. A single thread of the pappus.

were over a century old. Some experiments made by Ha landt in 1861, the percentage of wheat which germinated as follows: Those of 1850 and '51, none germinated; 1854, 1855, 4; 1857, 73; 1858, 60; 1859, 84; 1860, 96.

Oxygen and moisture are the agencies which put a special limit to the duration of the germinative power of seeds.

Some of the rich bottom lands of this region, when in mow for a few years, show no traces of the Great Ragweed, when again cultivated, there springs up an abundance of

and other weeds. It is probable, in preparing the land for meadow, some of the seeds and fruits were deeply covered, and thus in a measure retained their vitality. Through cultivation the seeds and fruits have been turned up. The seeds of some



(*Cnicus pumilus*) a. Achenium with pappus. b. Single plumose thread.
c. A part of b. more highly magnified.

orders differ greatly in their power of germination. The Leguminosæ are capable of retaining their vitality for a long time, as the seeds are often provided with hard protective coverings (seed coats), which prevent decomposition.

DISSEMINATION OF WEEDS.

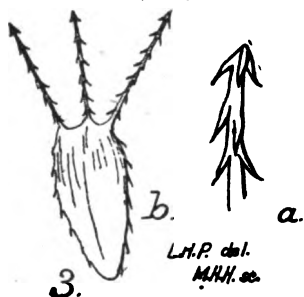
We can conveniently make two modes:

1. Natural agencies—Wind, animals, water, snow, explosive properties of the fruit.

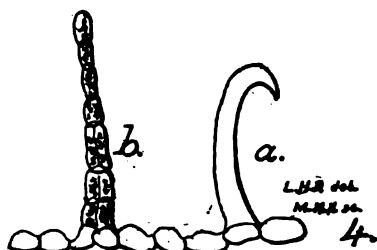
2. Where man is chiefly concerned—Impure seeds, railroads and other carriers, planting for ornamental purposes.

In most cases the fruits and seeds of our first division have certain structures in form of burs, hairs, etc., which enable them to be disseminated,

In many of the compositæ, the calyx, the outer set of the floral envelopes, is made up of a collection of fine, thread-like bodies, collectively called the pappus. In Prickly Lettuce (*Lactuca scariola*, L.) The achenium (a one-seeded seed like fruit),



3. (*Bidens Connata*) b. Achenium with its awns barbed downwardly. a. One of the awns more highly magnified.



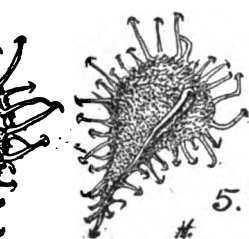
Trichomes of (*Desmodium canescens*) a. Hooked trichome. b. Ordinary trichome. c. Epidermal cells magnified 122 times.

is carried out into a long beak bearing the pappus at its end. See Fig. 1. In another composite, The Pasture Thistle (*Oniscus pumilum*, Spreng.) The pappus is made up of numerous fine and long threads which are plumose. See fig. 2. Such fruits are easily carried about by the wind, the akenes being in most cases light. The seed s or fruits disseminated by animals, at least among most of our weeds, are hooked and barbed. In *Bidens connata* the achenium bears three awns which are barbed downwardly. See Fig. 3. In *Echinosperrum lappula* the small nutlets (forming burs which are not seeds but quarter portions of seed-like fruits—6 b), are covered with a double row of grappling organs. See Fig. 5. These burs easily fasten themselves to any passing object.

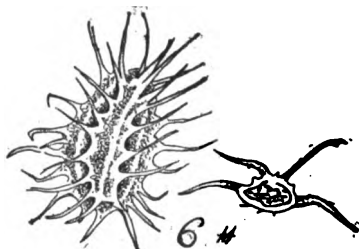
In Tick Trefoil (*Desmodium canescens*, D C.), a troublesome roadside weed in the South, the pod breaks up into several transverse joints, and by means of the small trichomes (plant

which are hooked, as shown in Fig. 4, is enabled to cling to the fleece of animals and clothes of persons, and thus it is carried great distances. Birds aid also in disseminating seeds, by the mud containing seeds which clings to their feet, and the eating of seeds, which pass through the digestive apparatus and are still capable of germinating. The water acts mechanically in a mechanical way by carrying the seeds of weeds. The writer has often seen Tumble-weeds, Pig-weeds, Thistle seeds on the surface of the snow which were drifting before the wind and when the snow melts in the spring these seeds and are often carried still further by the water.

Some fruits, Touch-me-nots (*Impatiens*), Wood Sorrels (*Oxalis*), burst when the pod is touched, thus scattering the seeds several feet.



5. *Echinochloa crusgalli* (Barnyard Grass) as found in Beal's Grasses of N. A.



6. (*Daucus carota*) a. Whole fruit with prickles. b. Cross section, after Sudworth in Beal's Grasses of N. A.

IMPURITIES IN SEEDS.

Lazenby found in Michigan Amber wheat sent out by the Department of agriculture for 1884, the following impurities: *Bromus secalinus*, 9,248 seeds per bushel, an estimate upon the amount found in one quart; Corn Cockle (*Lychnis*), 1,888; Oat (*Avena sativa*), 160; Barley (*Hordeum jubatum*), 32; and Thistle (*Sonchus*), 32.

Some of our most troublesome weeds are introduced in this way, such as the Corn Cockle, Wild Oat (*Avena fatua*) etc.

It is well known that railroads are a great factor in the dissemination of pernicious weeds. One or two cases will suffice. Cheat-grass (*Hordeum jubatum*) was not known to occur in Michigan until last summer when it was found for the first time along the C., M. & St. P. railroad. Common Flax (*Linum catharticum*, L.) is commonly found along railroads where the

seeds must have fallen from passing freight cars, and hosts of others might be mentioned.

Years ago it was a matter of common observation when farmers hauled their grain long distances to some market that along the road could be found Chess, Corn, Cockle, etc. It can now be seen but in a less marked degree.

MIGRATION OF WEEDS.

Many of our most troublesome weeds are foreigners, as is manifestly apparent from the table at the end of this list. Many have become so thoroughly naturalized that it is difficult to make a line of separation of the truly indigenous (native) and those naturalized. While we have added a large number of European plants, Europe has received from us, such as the common Horseweed *Erigeron canadense*, the common Evening Primrose *Oenothera biennis*, and *Anacharis canadensis* a harmless North America water plant, said to be so abundant in England as to clog up canals. Some of our weeds which were at first ballast plants along the seaports, have moved westward. Prickly Lettuce *Lactuca Scariola*, which was for many years an adventive in eastern New England, has since 1874 spread with remarkable rapidity, and is now found in many of the states east of the Mississippi river. Some western native plants have moved eastward and have become pernicious weeds. *Solanum rostratum* native of Kansas and Southwest, has traveled eastward and has been reported from New York. Of the less troublesome weeds the Worm Wood *Artemisia biennis*, Cone Flower *Rudbeckia hirta* reported as common in the East and inclined to be weedy.

In the arrangement of the orders and genera I have followed Bentham & Hooker's Genera Plantarum. The nomenclature that given in Dr. Gray's Synoptical Flora of North America (Gamopetalae), Watson's Bibliographical Index to North American Botany (Pt. 1 Polypetalae) and Botanical contributions of Sereno Watson and Dr. Gray.

The introduced weeds are printed in italics.

CRUCIFIRAE.

Sisymbrium officinale, Scop. Hedge Mustard. Abundant in waste places and has become naturalized from Europe.

Brassica sinapistrum, Boissier. Yellow Mustard. Frequently found in grain fields where it may become a great nuisance, as it is in Eastern United States and in Europe.

Nasturtium armoracia Fries. Horse Radish. This perennial plant, first cultivated for its roots, which are well known as a condiment, has become thoroughly naturalized and is difficult to exterminate, though it spreads only by non-sexual means. It grows so profusely that all other plants are suffocated. It is European.

Capsella bursa-pastoris, Moench. Shepherd's Purse. A common dooryard weed, abundant in waste places, roadsides, etc. flowering very early. It is a native of Europe, and has long been naturalized in this country and many other parts of the world.

Lipidium virginicum, L. This, unlike the foregoing crucifers, is a native of Southern United States. It is found along roadsides, in fields, in waste places, and seems to adapt itself to various kinds of soil.

CARYOPHYLLEAE.

Lychnis githago, Lam. Corn Cockle. A very common weed in grain fields. The large black seeds are very conspicuous in grain. The seeds are roughened and very often if the farmer is not careful the larger seeds pass over with seed wheat. Cockle commonly matures earlier than wheat and oats, so that the seeds are liable to remain in the field.

The "screenings" of wheat, oats, etc., are largely used for feeding cattle, and as they are likely, and do, in a great many cases, contain the seeds of cockle and common Vetch or Tare, the farmer ought to be somewhat cautious in feeding his cattle. In some cases it is customary to boil or grind the "screenings;" in other cases it is fed raw, the seeds thus entering into compost, some passing the digestive apparatus without materially affecting the germinative powers of the seeds.

If it be preferable to feed "screenings" raw, the compost ought to remain till thoroughly rotted.

This weed is also very troublesome in Europe. (Thaer, 1.)

The following two ought to be included, but neither of them is troublesome: *Cerastium viscosum*, L. Mouse Ear Chickweed. *Stellaria media*, Smith. Common Chickweed. Troublesome in Europe (Thaer, 2.)

Saponaria vaccaria, L. Cow Herb. Becoming abundant in grain fields in Houston County, Minn. The larger seeds often found in seed wheat after cleaning. The smaller seeds into "screenings."

PORTULACEAE.

Portulaca oleracea, L. Common Purslane.

This common garden weed with succulent stems and leaves well known by almost everyone who has had any experience in gardening. This plant ought not to be left in the field or garden when pulled up, as severed parts readily develop into new plants by the formation of roots. It is also a well known weed in Europe. Fendler found it wild in Texas and Nuttall on the Mississippi (Dr. Gray, 2.) Something very near to the common purslane was found by Lind Heimer (Englemann). It has the appearance, however, of being naturalized.

MALVACEAE.

Malva rotundifolia, L. Common Mallow.

Common around old dwellings, along roadsides, etc. Found in similar places in Europe.

Abutilon avicennae, Gertn. Indian Mallow.

It has spread quite rapidly. A few years ago, 1882-83, straggling specimens were found along roadsides; now abundant in gardens and fields, especially where the soil is rich and of a loamy nature, or in loamy drifts. Last summer I found it in a field in the northern part of La Crosse Co., Wis., where it has completely taken possession. The plant is a native of Asia, but has probably moved northward along the Mississippi River. Baron von Mueller reports it as occurring in Australia.

GERANIACEAE.

Oxalis stricta, L. Yellow Wood-sorrel.

Common in grain fields, not particularly troublesome.

LEGUMINOSAE.

Vicia Sativa, L. Common Vetch or Tare.

It is about the only really troublesome Leguminous plant we have, and, like Corn Cockle, is abundant in grain fields. The seed are somewhat larger than Corn Cockle and smooth. In Europe it is largely used as a forage plant and greatly preferred (Kraft, 1).

ROSACEAE.

Geum, Album, Gmelin. White Avens.

Becoming abundant along roadsides and borders of woods.

Potentilla norvegica, L.

Common in waste places, fields and gardens.

Agrimonia eupatoria, L. Agrimony.

Common along roadsides, abundant in Europe, and troublesome in Southern Russia (Koppen), and especially as the fruits fasten themselves to the fleece of sheep. Baron von Mueller reports it as common in Australia.

Rosa blanda, Ait. Early Wild Rose.

Sometimes common in grain fields, where it causes annoyance in harvesting.

ONAGRARIÆ.

Oenothera biennis, L. Common Evening Primrose.

In fields and waste places with a rather loamy soil. It is well known in Europe, where it has become naturalized.

Oenothera rhombipetala, Nutt. Evening Primrose.

Especially common on sandy prairies.

CUCURBITACEÆ.

Sicyos angulatus, L. One Seeded Star Cucumber.

Along borders of streams and in moist places.

FICOIDEÆ.

Mollugo verticillata, L. Carpet Weed.

Common in dry fields, an immigrant from the South.

UMBELLIFERÆ.

Conium maculatum, L. Poison Hemlock.

Not particularly troublesome as a weed, but from the fact that it and the following are very poisonous, they ought to be mentioned:

Cicuta maculata, L. Water Hemlock.

Grows in marshes and swamps.

Peucedanum sativum, Benth. & Hooker. Wild Parsnip.

Common in and about gardens, especially where Parsnip culture has been carried on, rapidly spreading.

Daucus Carota, L. Wild Carrot.

In dooryards, and very abundant in dry fields. A weed of Europe.

COMPOSITAE.

Erigeron annuus, Pers. Tall Daisy.

Common in waste places, and in moist soil.

Erigeron Canadensis, L. Horseweed. •

In fields and waste places. Very abundant, especially in light soil. The Tall Daisy and Horseweed are extensively naturalized in Europe. (Ratzeburg, etc.)

Erigeron Strigosus, Muhl. Daisy Fleabane.

The plant is frequent in dry clay soil, but not as "weedy" as either of the above.

Gnaphalium decurrens, Ives. Common Everlasting.

In old dry fields.

Inula helenium, L. Elecampane.

Thoroughly established in the northern part of Vernon Wis., along roadsides.

Ambrosia artemisiæfolia, L. Common Ragweed.

Abundant along roadsides and fields, especially where the soil has been loosened.

Ambrosia trifida, L. Great Ragweed.

More troublesome than the preceding, especially common in rich bottom land. It is a coarse plant from eight to ten feet high, and when numerous growing, crops have little chance to develop.

Xanthium Canadense, Mill. Cockle-bur.

Along roadsides in loose sandy and gravelly soil. Becomes more numerous. A very troublesome weed in Russia. (Koenig, 2.)

Bidens frondosa, L. Common Beggar Ticks.

Along roadsides and in waste places.

Anthemis Cotula, L. Mayweed.

Common in dooryards, along roadsides, and in waste places in rather hard soil, preferably clay or loam. Also troublesome in Europe. (Thaer, 3 and Ratzeburg, 1.)

Achillæa millefolium, L. Yarrow.

In poor and dry pastures, and along roadsides. Its presence is an indication that the soil is rather poor. The plant is widely distributed across the continent of America, and also in Europe.

Chrysanthemum leucanthemum, L. Daisy.

common. In this region only a few localities are known; La Crosse, which is now obliterated, and in several other places a few straggling specimens. In eastern United States this is especially troublesome, but in Wisconsin and Minnesota it is more common and somewhat local.

Matricaria vulgaris, L. Common Tansy.

One time largely cultivated as a garden plant, and now highly naturalized. Along borders of fences and roadsides. Perennial is somewhat difficult to exterminate.

Achillea biennis, Willd. Biennial Wormwood.

Common in waste places, dooryards and roadsides. Rapidly spreading eastward.

Xanthoxylum lappa, L. Burdock.

Grows along fences, in waste places in rich soil. The plant persists once established, but does not spread as rapidly as many other weeds, as most farmers cut the plant off, not allowing it to mature its fruit.

Cirsium arvense, Hoffm. Canada Thistle.

Unfortunately this plant is not as common here as it is in the northern states. Mr. J. S. Harris reports it from Trempealeau County, Wis., and in Upham's catalogue of The Flora of Minnesota, it is reported from Fillmore Co. In July, 1886, I found it in the northern part of La Crosse Co., Wis., where it is said to have been introduced some fifteen to twenty years ago. Prof. Beal

"Its course westward is likely to be checked by the fact that it has usually failed to produce seeds on the prairies." It spreads freely below ground. It is a common weed of Europe. Linnaeus in his *Flora Lapponica*, considered it one of the greatest pests of the fields. (George Thurber, 3.)

He recommends deep plowing, several times in a season, and after each plowing, to pull up the root stocks. Also that a field of Lucerne *Medicago* or *Onobrychis Sativa*, will destroy it. Prof. Beal, (1) finds Red Clover a good weed exterminator. Canada Thistle seems to be most abundant on loamy soil.

Cirsium lanceolatum Hoffm. Common Thistle.

It is likewise a common weedy plant of Europe, and in this country is very troublesome, at times especially, in loose and rich soil. It is a biennial and hence is much easier to deal with.

Cirsium pumilum, Spring, Pasture Thistles.

Sometimes troublesome in dry rocky pastures.

Lactuca intybus, L. Succory or Cichory.

It has become established along roadsides, and proves a most persistent weed where introduced.

Taraxacum officinale Web. Dandelion.

Common everywhere, along roadsides, in pastures, etc.

Sonchus aleraceus, L. Common Sow Thistle.

Common in gardens and about dwellings.

ASCLEPIADEAE.

Asclepias cornuti, Decaisne, Common Milkweed or Silkweed.

Common in this section and often troublesome. A most pernicious weed in The Traverse Bay region, Michigan, and according to Prof. Beal (3) in many other portions of Michigan, especially in light soil. It is more commonly found in rich, rather loamy black sandy soil. It strikes root very deeply, and is difficult to exterminate on that account.

Asclepias tuberosa, L. Butterfly-weed.

Common on sandy soil and occasionally "weedy."

BORAGINEAE.

Cynoglossum officinale, L. Hound's Tongue.

Common along roadsides, La Crescent, Minn., and in pastures.

Echinosperinum lappula, Lehm. Stickseed.

In gravelly soil, along roadsides, common. A troublesome weed in Southern Russia (Koppen), the burs fastening themselves to the fleece of sheep.

Echinospernum virginianum, DC. Beggar's Lice.

In woods, and borders of woods and along fences.

CONVOLVULACEAE.

Convolvulus sepium, L. Common Morning-glory.

The weed is troublesome in grain and corn fields, using growing grain as a support, often pulling it to the ground. The weed is one of the most difficult to exterminate.

SOLANACEAE.

Solanum migrum, L. Common Nightshade.

In shady and waste ground, common.

Datura stramonium, L. Jamestown Weed. Locally it is known as Jimson weed, a corruption of Jamestown.

coming more plentiful. It is especially common in the Brownsville, Minn., and also found in a few places on the east side of the Mississippi river. The plant is a native of Asia, but with us it has probably made its way northward along the Mississippi.

SCROPHULARINEAE.

Verbena thapsus, L. Common Mullein.

Common in dry and old pastures, on rocky hillsides. Not so exterminate as it is a biennial; removing the young with a hoe will easily destroy it. Is occasionally "weedy" in places.

Physalis vulgaris, Mill. Toad Flax.

Ubiquitous, now and then found in neglected gardens, and there in the streets of cities. Said to have been distributed as a garden flower by the Department of Agriculture.

Figularia nodosa, L. Figwort; Simpson's Bee Plant. That weedy in rich soil and in damp places.

LABIATEAE.

Thymum canadense, L. Germander.

Common in fences, hedges, etc., but is frequently found in fields as noxious as to do a great deal of injury to growing crops. As early as 1846 Darlington, (3b.) found it to be somewhat of a noxious weed in Pennsylvania.

Nepeta cataria, L. Catnip.

Common along roadsides and fences, and occasionally in pastures in sandy soil.

PLANTAGINEAE.

Plantago major, L. Common Dooryard Plantain.

and the following are common dooryard weeds.

Plantago Rugelii, Decasine.

Common with the other. (*Plantago lanceolata*, L.), has not been introduced in this region. In the South and East it is a troublesome weed. It has established itself at Madison, Wis.

AMARANTACEAE.

Amarantus retroflexus, L. Pigweed.

Common in manured soil, in fields, etc. Is a native of tropical America. (?)

Amarantus albus, L.

Common in black sandy soil. In autumn it breaks off at root and is driven before the wind. Naturalized from tropical America. (?)

CHENOPODIACEAE.

Chenopodium album, L. Pigweed.

Common in rich and loose soil.

Chenopodium botrys, L. Jerusalem Oak.

Dry soil in streets of cities.

POLYGONACEAE.

Rumex acetosella, L. Sheep's Sorrel.

In gravelly soil and in old fields. It is said that where the plant occurs, the soil is sour (Thaer, 15), and that an addition of lime or manure will drive it away. It is certain that the soil of Western Wisconsin and Southeastern Minnesota contains a good deal of lime. The absence of lime can therefore hardly account for its abundance.

Rumex crispus, L. Curled Dock.

More common on high land, pastures, etc. The following *Rumex obtusifolius*, L. Bitter Dock, is largely found in meadows and pastures and is exceedingly troublesome in preventing the growth of useful forage plants. Cattle will avoid it in all conditions. It is difficult to exterminate, as it has a very long tap root and is a perennial.

Polygonum aviculare, L. Knotgrass.

A common dooryard weed.

Polygonum convolvulus, L.

Common in cultivated grounds and grain fields in loamy soil.

Polygonum erectum, L.

Common in dooryards, etc.

Polygonum persicaria, L. Smartweed.

In waste places, and low grounds, rich soil.

Polygonum hydropiper, L. Common Smartweed.

Common in moist and wet grounds.

EUPHORBIACEAE.

- Euphorbia Cyparissias*, L. Cypress Spurge.
 Growing from several cemeteries, La Crosse and North Bend,
 and La Crescent, Minn.
Euphorbia maculata, L. Creeping Spurge.
 Common along roadsides, in dooryards, and on sandy soil.

URTICACEAE.

- Urtica gracilis*, Ait. Nettle.
 Common along fences, hedges, etc.
Cannabis sativa, L. Hemp.
 This weed is common along roadsides, especially in light loamy

GRAMINEAE.

- Elymus capillare*, L. Old Witch Grass.
 Common in sandy soil and cultivated fields.
Elymus crusgalli, L. Barnyard Grass.
 In rich and wet soil, common.
Elymus Sanguinalis, L. Common Crab or Finger Grass.
 Growing numerous along roadsides.
Eleocharis acicularis, Trin.
 Common along the borders of woods, fences, in damp clay and
 soils.
Elymus glauca, Beauv. Fox-tail Grass.
 Common weed in stubble, poor meadows, etc.
Elymus viridis, Beauv. Green Fox-tail Grass.
 More troublesome than the last in corn fields and cultivated
 generally.
Xanthoxylum tribuloides, L. Hedgehog or Bur-Grass; but
 known as Sandburs.
 In poor sandy soil along rivers, etc.
Avena fatua, L. Wild Oats.
 In grainfields. Introduced a few years ago and somewhat
 common. This species is widely diffused, in Australia,
 America, etc. Employed for fodder in California and said
 to be very good.
Triticum secalinus, L. Chess or Cheat.
 In grainfields especially noticeable in winter wheat or rye.
 Common in meadows, but is not invaluable as a forage plant.
Cynodon dactylon, Beauv. Couch Grass.

In grainfields, where it is a nuisance, but as a forage plant is valuable.

Hordum jubatum, L.

It is probably only a waif. It is not a native here. In 1886, I found a small patch on the C., M. & St. Paul R. R. La Crescent, Minn.

Table showing origin of weeds.

ORDERS.	Eu.	U.S.	Eu.&U.S.	Trop. Am.	Asia
Cruciferae.....	4				
Caryophyllae.....	3	1	1		
Portulacae.....	1				
Malvaceae.....	1				1
Geraniaceae.....		1			
Leguminosae.....	1				
Rosaceae.....		3			
Onagraceae.....		2			
Cucurbitaceae.....		1			
Ficoideneae.....		1			
Umbelliferae.....	3	1			
Compositae.....	10	10	1		
Asclepiadeae.....		2			
Boraginaceae.....	2	1			
Convolvulaceae.....					
Solanaceae.....	1				1
Scrophularineae.....	2	1			
Labiatae.....	1	1			
Plantagineae.....	1	1			
Amarantaceae.....				2	
Chenopodiaceae.....	2				
Polygonaceae.....	5		3		
Euphorbiaceae.....	1	1			
Urticaceae.....	1	1			
Gramineae.....	5	4	2		
Totals.....	44	32	8	2	2

Of the 88 weeds represented in this list, 44 are European of American origin, and nearly one-third of these come from the compositae, the most troublesome of our weeds and a one-fourth of the entire list are members of the compositae.

The following are some of the important papers and works on the subjects which have been consulted:

ARTHUR, PROF. J. C.

4th and 5th Annual report of the N. Y. agricultural experiment station, pages 262 and 298.

BEAL, PROF. W. J.

Grasses of North America (1) Vol. 1. p. 219;(2) p. 235; 222 figures the seeds and fruits and has appended some remarks concerning the common weeds affecting the meadow. p. 100, 224, 273.

INGTON, WM.

American Weeds and Useful Plants. Revised by George Thurber, (1) p. 199, (2) p. 241.

FRIEVICZ, NICOL.

Vie lange bewahren die Samen unserer Culturpflanzen ihre Keimfähigkeit. In Haberlundt's Wissenschaftliche Untersuchungen, etc.

EMANN, DR. GEORGE.

n Plantæ Lindheimerianæ, p. 154.

, DR. ASA.

arwiniana.

(1) Am. Naturalist, Burs in the Boarage family. Vol. X, 1876, p. 1.

(2) Am. Jour. of Sc. Vol. XXV, p. 253, and Vol. XXVI, p. 138.

RLUNDT, Dr. G.

) Wissenschaftlich-practische Untersuchungen auf dem Gebiete des Pflanzenbaues.

2) Wiener Landw. Zeitung, 1873, p. 126.

Dr. EGON.

studien zur Pflanzengeographie; Verbreitung von *Xanthium strumarium* und Geschichte der Einwanderung von *Xanthium spinosum*.

CH, Dr. WILHELM.

as Pflanzenleben der Erde.

EN, FR. TH.

ür verbreitung des *Xanthium spinosum* L., besonders in Russland, nebst kürzen notizen über einige andere Unkräuter Süd Russlands, p. 36, (2) p. 35.

T, Dr. GUIDO.

flanzen Baulehre. (1) p. 76 and 189.

In this work are enumerated the principal weeds, with figures of fruits and seeds of many of the troublesome weeds in the fields and gardens of Germany.

BY, Prof. W. R.

Report on Weeds, Ohio Agricultural Experiment Station, 1884 and 1885. (1) 1884, p. 158. (2) 1885, p. 185.

weedy plants of Ohio.

Proceedings of the 7th annual meeting of the Society for the Promotion of Agr. Science, 1886.

INS, CH.

expérience sur la Persistance de la vitalité des Graines flottant a la surface de la Mer.

MUEHLER, BARON VON.

Systematic Census of Australian Plants.

NOBBE.

Handbuch der Samenkunde.

Likewise he figures the fruits and seeds present as in
ties in various seeds, especially those affecting
agricultural seeds of Germany.

RATZEBURG, Dr. J. T. C.

Die Standortsgewächse und Unkräuter Deutschland
Schweiz. Berlin, 1859. (1) p. 59.

SCRIBNER, Prof. F. L.

Weeds of Maine, in Agriculture of Maine, 1869, p. 23.

SEYMOUR, Prof. A. B.

Weeds mentioned in weed law of 1884-85, Wis., and s
other weeds. Report of Wis. Agricultural Exper
Station for 1885.

STURTEVANT, Dr. F. L.

First annual report of N. Y. Agricultural Experimen
tion, p. 86.

THAER.

Die Landwirthschafterchen Unkräuter; 24 chromo-lithog
ic plates. (1) p. 9, Taf. IV. (2) p. 10, Taf. V. (3)
(4) p. 8, Taf. IV. (5) p. 11, Taf. VI.

UPHAM, WARREN.

Flora of Minnesota.

Shaw School of Botany, April 1887.

GENERAL INDEX.

A

	Page
President's annual address.....	189
of welcome, Prof. D. R. Maginnis.....	50
ural Society, Officers of.....	12
ural education, lecture of President Northrop.....	200

Cane Association —

President's annual address.....	165
ceedings at annual meeting.....	161
ane industry, S. H. Kenney.....	170
ment of constitution.....	224, 415
n Forestry Congress, resolutions by.....	460
n Horticultural Society, meeting of.....	233

an Pomological Society—

legates to.....	414
ferred to.....	118
address of president.....	105, 165

l Reports —

arian's report.....	248
retary's annual report.....	223
retary's financial statement.....	245
asurer's annual report.....	246

state fair.....	83
cussions on.....	86, 156
nesota seedlings.....	144
estation of growing considered.....	229
sian varieties.....	83, 148, 330, 350, 454
ieties recommended.....	416
od of, from A. G. Tuttle.....	67
ment of committees.....	21, 49
y General Clapp's opinion.....	464
of premiums.....	22, 377

B

Barrett, J. O., laws governing hardiness of plants.....	
Birds in horticulture, Eugene E. Harris.....	
<i>Blackberries</i> —	
Culture of.....	29,
Discussion on.....	
Reports on.....	282, 288, 291, 339, 348,
Varieties recommended.....	31,
Black list.....	
Blakeley, Capt. R., address as president.....	
Bohland, A., report as president Ramsey County Society.....	
Brand, O. F., resolution on evergreens.....	
<i>Brimhall, W. E.</i> —	
Committee on vegetables.....	
Report on fruit.....	
<i>Brimhall, W. H.</i> —	
Report as superintendent.....	
Superintendent of exhibits.....	
<i>Budd, Prof. J. L.</i> —	
Comments on apples, etc.....	
Letters from.....	
Bunnell, M. C., report on fruit.....	

C

Call for meetings.....	17
Cold is king, E. H. S. Dartt.....	
Cook, M. W., report on small fruit.....	
<i>Committee</i> —	
Award of premiums.....	21
Finance.....	
Floriculture.....	
Fruit, flowers and vegetables.....	21
Legislation.....	
Obituary.....	49,
President's annual address.....	
Standing.....	
Resolutions.....	21
Revision fruit list.....	100,
Tree peddlers.....	280,
Vegetables.....	
Competition in fruit growing.....	
Constitution and by-laws.....	
Corp, S., report on fruit.....	

Condence—

	Page.
f. J. L. Budd	69
S. Chapman	163
J. Colman	162
L. Cotterell	71
Crawford	219
Doppelmaier	217
S. Faurot	218
M. Ford	219
ss. Frankland	380
ss. Gibb	65
ver Gibbs, Jr	220
J. Kellogg	219
n Little	379
T. Lyon	68
ss. T. Ohmer	71
o. P. Pepper	68
K. Phoenix	68
B. Rogers	381
a. Selbie	73
aman M. Smith	61
O. Taggart	72
G. Tuttle	67
E. Van Deman	65
rs. P. Wilder	244
as Wilson	384
H. I., report as secretary	56
tion of strawberries, J. M. Smith	409
s	284, 288, 291, 292, 417

Milon—

dress as president of local society	446
port as vice president	287
E. A., report as librarian	248
s and tornadoes	40

D

E. H. S. —

d is king, how modified, etc.	71
port as vice president	284
erintendent of experiment station	284, 293
, committee on fruits	21
E., report on fruit	357
es to Dakota	90
es to Wisconsin	414, 426
re, B., scientific paper on heat	174

Discussion —

On apples.....	8
Birds.....	
Black walnut.....	
Climatic influences, etc.....	3
Fairs.....	
Forestry.....	
Grafting.....	
Grapes.....	105, 25
Owatonna experimental station.....	
Place of next meeting.....	
Pruning.....	
Question box.....	
Russian fruits.....	
Seedling fruits.....	144, 15
Small fruits.....	3
Tree peddlers.....	159, 190, 26
Vegetables.....	9
Dissemination of weedy plants, L. H. Pammel.....	
Distribution of Reports.....	
Doppelmair, G., letters from.....	

E

Election of officers.....	16
---------------------------	----

Elliot, Wyman —

Annual address as president.....	
Delegate American Pomological Society.....	
Emery, S. M., report on fruits.....	
Entomologist's report, Prof. O. W. Oestlund.....	
Entomology.....	111, 35

Evergreens —

Discussion on.....	
Resolution on planting.....	
Varieties recommended.....	
Exhibits.....	233, 3
Experimental farm of state university.....	3

Experimental Stations —

At Owatonna.....	2
Importance of.....	109, 242, 2
Reports from.....	329, 344, 345, 347, 3
Stations established.....	2
University farm.....	

F

	Page.
Stock and Home, selections from.....	85, 244
resolutions.....	41, 417
the committee, report of.....	248
social condition of society.....	161, 247
culture, papers read.....	306, 368, 369
culture in South California, L. M. Ford.....	63
y.....	232, 336, 341, 415, 460
<i>District Reports—</i>	
W. Sias, Rochester.....	281
H. S. Dartt, Owatonna.....	284
John Cutler, Sumter.....	287
O. W. Fuller, Litchfield.....	356
Growing in North west, J. S. Harris.....	449
list, revision of.....	100, 416
<i>Geo. W.—</i>	
reports on fruit.....	350, 356
report on seedlings.....	144

G

G. E., letter from referred to.....	266
fruit committee reports.....	353, 367
Chas., letters from.....	65
Jr., Oliver, letter from.....	220
<i>G. Peter M.—</i>	
report from state fruit farm.....	152
seedlings of referred to.....	127, 152
seedlings for distribution.....	154
berries.....	291, 356, 414
F. G. rose culture.....	368
g, discussion on.....	305
culture, M. Pearce.....	101
growing for farmers, J. B. Rogers.....	381
<i>G.—</i>	
fruit varieties of, Silas Wilson.....	384
culture of, M. Pearce.....	101
discussion on.....	105, 259, 386
papers on.....	101, 381, 384
winning of.....	102, 455
reports on crop.....	283, 291, 332, 335
varieties recommended.....	102, 334, 384, 416
Chas. A., How to eat strawberries.....	457
O. C., address on fairs.....	196

Grimes, J. T. —

Committee on tree peddlers.....	4
Printing President Northrop's address.....	4
Report committee on tree peddlers.....	4
Report as treasurer.....	4
Vegetable exhibit at state fair.....	4

H

Harmony of action.....	4
Harrington, G. W., Report on fruit.....	4
Harris, E. E., Birds in horticulture.....	4

Harris, J. S. —

Committees.....	4
Delegate to Dakota.....	4
Delegate to Wisconsin.....	4
Memorial on Marshall P. Wilder.....	4
Papers by.....	23, 296, 4
Report on fruit.....	3
Resolution on black list.....	3
Seedling commission report.....	3
Hennepin County Horticultural Society.....	3

Hillman, S. D. —

Introductory note to portfolio.....	3
Letter to Olmsted County Society.....	3
Report as secretary.....	3
Hillside orchard on university farm.....	3
Honorary life members.....	3
Honorary members five years.....	3

Hoag, M. J. —

Report on small fruit.....	3
Report as secretary of Olmsted County Society.....	3
Horticultural education.....	3
Horticultural sermon on flowers, Mrs. Anna B. Underwood.....	3
Horticulture at Southern Minnesota Fair.....	3
Horticulture on state university farm, Prof. E. D. Porter.....	3
Horticulture.....	10
Hoskins, Dr. T. H., Russian apples.....	35
Hybrid varieties.....	232, 35

I

	Page.
.....	4-7
cane growers, resolutions of approval.....	164
iam.....	118, 122
.....	320, 366, 411, 438
ory note, secretary's portfolio.....	425

J

awberries	219, 249
ursery Co., report on seedlings.....	146
ions.....	43, 49
Mrs. E. B., crop of fruit.....	281, 282

K

as. A., Russian apples at state fair.....	83
<i>Geo. J.—</i>	
r from.....	219
new strawberry	249
Seth H., the amber cane industry.....	170
Chas., report on fruit.....	289

L

A. W., committee final resolutions	49
erning hardiness of plants, J. O. Barrett.....	392
sting to horticulture.....	324, 462
r	413
gricultural education, Prof. C. Northrop.....	200
on fairs, O. C. Gregg.....	196
Gov. McGill.....	2
's report.....	248
uits.....	416

Societies —

an Horticultural Society, Ramsey county.....	57
epin County Horticultural Society.....	54
ood County Horticultural Society.....	56, 446
nesota Valley Horticultural Society.....	58
sted County Horticultural Society.....	56, 434

Lord, O. M.—

Experimental station report.....	
Paper on native plums.....	
Report on fruit.....	
Luedloff, Chas., the use of forests.....	
Lyon, T. T., letter from.....	
Lyons, Wm., report on vegetables.....	

M

Maginnis, Prof. D. R.—

Address of welcome.....	
Award of premiums.....	4
On forestry.....	
On president's address.....	12
Mechanics and chemistry of heat, B. Denamore.	
Meetings.....	17, 4
Membership of society.....	
Memorial resolutions.....	
McHenry, Wm., report on fruit.....	

N

Necrology	11
Northrop, Prof. Cyrus, lecture on agricultural education.....	
Northrop, J. E., report as secretary.....	
Norwood, O. F., report on fruit.....	
Notes by the wayside, C. L. Smith.....	
Nursery frauds.....	112, 155, 159, 190, 265, 28

O

Object lessons, A. W. Sias.....	
Oestlund, Prof. O. W., report as entomologist.....	

Officers—

Amber Cane Association.....	
For current year, 1887.....	
Hennepin County Society.....	
McLeod County Society.....	
Minnesota Valley Horticultural Society.....	
Olmsted County Society.....	
Ramsey County Society.....	
Ohmer, Chas. T., letter from.....	
Olmsted County Horticultural Society.....	5

S. M.—

	Page.
Committee on publication	292
Response to address of welcome.....	51

P

Plants, L. H., weedy plants, etc.....	469
---------------------------------------	-----

P—

Address on fairs, O. C. Gregg.....	196
Sugar cane industry, Seth H. Kenney..	170
Best varieties of grapes, Silas Wilson.....	384
Plants in horticulture, Eugene E. Harris.....	252
Plum is king, how modified, etc., E. H. S. Dartt.....	73
Cultivation of strawberries, J. M. Smith.....	409
Peromology in Illinois, C. M. Weed.....	459
Periculture in South California, L. M. Ford.....	63
Pit Growing in the Northwest, J. S. Harris.....	449
Peach culture, M. Pearce.....	101
Peach growing for farmers, J. B. Rogers.....	381
Pericultural sermon on flowers, Mrs. Anna B. Underwood.....	369
How to eat strawberries, Chas. A. Greene.....	457
Plants governing the hardness of plants, J. O. Barrett.....	392
Pit plums, O. M. Lord.....	373
Plants by the wayside, C. L. Smith.....	260
Propagating by budding, etc., J. S. Harris.....	296
Permeability and chemistry of heat, B. Densmore.....	174
Plants collections among small fruits, J. M. Smith.....	311
Peach culture, F. G. Gould.....	348
Small fruits for market and home use, J. S. Harris.....	23
Use of forests, Chas. Luedloff.....	341
Weedy plants, etc., L. H. Pammel.....	469
Wild flowers, Mrs. Charlotte O. Van Cleve.....	306
P. M., grape culture.....	101
P. apple.....	144, 159, 377
Geo. P., letter from.....	68
P. n, Andrew, report on fruit.....	350
P. k, F. K., letter from.....	68
P. next meeting.....	414
O. M. Lord.....	344, 373, 358

P., Prof. Edward D.

Remarks by.....	33
Report from experiment station.....	339
Report as secretary and treasurer.....	161
Resolution on Hatch bill.....	184
Resolution on tree peddlers.....	280

Porter, Prof. Edward D.—Continued.

	Page.
Superintendent of exhibits.....	19
Superintendent experimental farm.....	33, 329
Portfolio of secretary.....	425
Premiums awarded.....	22, 377
Premium lists.....	33, 47, 116
Preservation of forests.....	232, 341
President's annual address.....	105, 165, 446
Probstfield, R. M., report on fruit.....	351

Proceedings —

Summer meeting, 1886.....	21
Winter meeting, 1887.....	49
Programs of meetings.....	17, 43
Pruning and protecting grape vines.....	455

Q

Quality of Russian fruits.....	84
Question box.....	96, 159

R

Ramsey County Horticultural Society.....	57
Register, A. B., report as secretary.....	58

Raspberries —

Discussion on.....	33
Reports on.....	282, 288
Varieties recommended.....	29, 31, 288, 416
Response to address of welcome, S. M. Owen.....	51

Report —

Amber cane.....	182
On fruit.....	70, 281, 447
Entomologist.....	320
Librarian.....	248
Local societies.....	54
Nomenclature.....	376
President's address.....	189
Russian apples.....	148, 152, 330, 351
Russian apples at state fair.....	80
Secretary.....	223
Seedling commission.....	126, 140, 144, 146
Superintendent of exhibits.....	379
Treasurer.....	246
Vegetables.....	80, 388

tutions —

	Page.
ack list, of apples.....	152
committee on.....	21, 46
xperiment stations	184
nal resolutions.....	41, 417
orestry	415, 460
bituary resolutions, M. P. Wilder.....	125
rinting address of President Northrop.....	259
ree peddlers.....	280, 400
pective	116
son, Col. D. A., remarks by.....	39

s, J. B. —

etter from.....	381
rape growing for farmers.....	381
on exhibits	20, 49
ng, S., report on fruit.....	447

an Apples —

state fair, Chas. A. Keffer	83
discussion on.....	86
reports on.....	148, 152, 230, 330, 350, 454
iversity farm.....	330
varieties recommended.....	84, 151, 231

S

ers, O. E., report on fruit.....	356
ng fruits	126, 140, 144, 146
ary's portfolio.....	425
ng commission report.....	126, 140, 144

A. W. —

committee on revision of fruit lists.....	100
perimental station report.....	345
ject lessons in horticulture.....	434
port committee on nomenclature.....	376
port on fruit lists.....	416
port on Russian apples.....	148
port as vice president.....	281
port on seedling commission.....	140

ary —

roductory note to portfolio.....	225
etter from.....	442
port of.....	223

Small Fruits—

Discussion on.....	3
Fifty years among, J. M. Smith.....	
For market and home use, J. S. Harris.....	
Reports on.....	281, 284, 287, 292, 336, 348, 360, 363
Smith, C. L., notes by the wayside.....	

Smith, J. M.—

Cultivation of strawberries.....	
Fifty years among small fruits.....	
Smith, Truman M., letter from.....	
Standing committees.....	

State Fair—

Improvement of grounds	
Time of	
State fruit farm, at Excelsior	

Strawberries—

Discussion on	3
In Illinois	
New seedling.....	21
Reports on.....	229, 282, 283
Varieties recommended.....	26, 33
Stubbs, N. J., report on fruit.....	
Summer meeting, 1886.....	

T

Taggart, S. O., letter from.....	
The codling moth, J. S. Harris	

Transactions —

Summer meeting, 1886.....	
Winter meeting.....	
Tree peddlers.....	112, 155, 159, 190, 249, 265, 268

Tuttle, A. G.—

Letter from.....	
Orchard of.....	
Russian apples at state fair.....	

U

	Page.
wood, Mrs. Anna B., horticultural sermon on flowers.....	369
wood, J. M., report finance committee.....	248

University Experimental Farm —

Report from Prof. E. D. Porter.....	33, 339
Resolutions on.....	41
Summer meeting at.....	21

V

Veve, Mrs. C. O., wild flowers.....	306
Veman, H. E., letter from.....	65
Vegetable exhibit at state fair, J. T. Grimes.....	80
Vineyarding.....	240
Volume fourteen.....	243

W

Wheeler, Clarence, report on fruit.....	354
Wheeler, C. M., entomology in Illinois.....	459
Wheat plants, etc., L. H. Pammel.....	469

Wheeler, Marshall P. —

Portrait of (frontispiece.)	
Letter from.....	244
Memorial upon.....	118, 122
Wheat, Mrs. C. O. Van Cleve.....	306

Wheeler, Silas —

Letter from.....	384
Grape growing.....	386
Winter Meeting.....	49
Work of society.....	241

Y

Young, H. H., report committee on resolutions.....	41
--	----



ANNUAL REPORT

OF THE

AMERICAN

ORTHOGRAPHICAL SOCIETY

FOR THE YEAR 1894

NEW YORK

1895

PUBLISHED BY THE SOCIETY, 15 N. 4TH ST., N. Y. C.
AND BY THE AMERICAN BOOK CO., 24 N. 2ND ST., N. Y. C.
AND BY THE AMERICAN BOOK CO., 24 N. 2ND ST., N. Y. C.
AND BY THE AMERICAN BOOK CO., 24 N. 2ND ST., N. Y. C.

NEW YORK



PRINTED BY THE SOCIETY, 15 N. 4TH ST., N. Y. C.

AND BY THE AMERICAN BOOK CO., 24 N. 2ND ST., N. Y. C.

AND BY THE AMERICAN BOOK CO., 24 N. 2ND ST., N. Y. C.

AND BY THE AMERICAN BOOK CO., 24 N. 2ND ST., N. Y. C.

ANNUAL REPORT
OF THE
MINNESOTA STATE
HORTICULTURAL SOCIETY,
FOR THE YEAR 1888.

EMBRACING THE

TRANSACTIONS OF THE SOCIETY FROM MARCH 31, 1887, TO MARCH 31, 1888;
ALSO PROCEEDINGS OF THE ANNUAL MEETING OF THE
MINNESOTA AMBER CANE ASSOCIATION,
ESSAYS, REPORTS, ETC.

VOL. XVI.



Prepared by the Secretary, S. D. HILLMAN, Minneapolis, Minn.

ST. PAUL:
J. W. CUNNINGHAM & Co., STATE PRINTERS,
1888.

UNIVERSITY OF CALIFORNIA
LIBRARY
COLLEGE OF AGRICULTURE

LETTER OF TRANSMITTAL TO THE GOVERNOR

OFFICE OF THE SECRETARY,
MINNEAPOLIS, March 31, 1888

To Hon. A. R. McGill, Governor of Minnesota :

SIR: I have the honor to submit herewith, in compliance with your
legal requisition, the accompanying report for 1888, with supplementary
papers.

Respectfully yours,

S. D. HILLMAN,
Secretary Minnesota State Horticultural Society

TABLE OF CONTENTS.

MEMBERS FOR 1888	4
GENERAL FRUIT COMMITTEE.....	5
INTENDENTS OF EXPERIMENTAL STATIONS.....	5
ING COMMITTEES.....	6
MEMBERS —	
Annual.....	8
Honorary for Five Years	10
Honorary Life Members.....	11
MEMBERS STATE AGRICULTURAL SOCIETY.....	12
STITUTION.....	13
CEEDINGS OF TWENTY-FIRST ANNUAL MEETING.....	23, 146
CEEDINGS OF MINNESOTA AMBER CANE ASSOCIATION.....	129
IDENT'S ANNUAL ADDRESS.....	61
ETARY'S ANNUAL REPORT.....	205
URE OF PROF. W. W. FOLWELL	173
ESSAYS.....	293, 324
EXPERIMENT STATIONS.....	241, 364
ETARY'S PORTFOLIO —	
Report of Committee on Obituary.....	412
State and Local Societies.....	417
Cranberry Culture.....	445
Peerless Apple.....	447
Norway Spruce for Shelter Belts.....	449
Yellow Transparent Apple.....	451
General Index.....	453

OFFICERS AND MEMBERS FOR 1888.

PRESIDENT.

WYMAN ELLIOT.....Minneapolis

VICE PRESIDENTS.

A. W. SIAS.....Rochester

E. H. S. DARTT.....Owatonna

M. CUTLER.....St. Paul

N. J. STUBBS.....Long Prairie

G. W. FULLER.....Litchfield

SECRETARY.

S. D. HILLMAN.....Minneapolis

TREASURER.

DITUS DAY.....Farmington

EXECUTIVE COMMITTEE.

The President, Secretary and Treasurer *ex-officio* and

J. S. HARRIS, Chairman.....La Crosse

J. M. UNDERWOOD.....Lake Park

F. G. GOULD.....Excelsior

O. F. BRAND.....Faribault

ISAAC GILPATRICK.....Minneapolis

ENTOMOLOGIST.

PROF. O. W. OESTLUND.....Minneapolis

LIBRARIAN.

E. A. CUZNER.....College of Agriculture, Minneapolis

SUPERINTENDENTS OF EXPERIMENTAL STATIONS.

EDWARD D. PORTER.....	University Farm, St. Anthony Park.
S. DARTT.....	Owatonna.
M. GIDEON.....	Excelsior.
HARRIS.....	La Crescent.
LORD.....	Minnesota City.
ERWOOD & EMERY.....	Lake City.
SIAS.....	Rochester.
BRAND.....	Faribault.
ARCE.....	Minneapolis.
FULLER.....	Litchfield.
PROBSTFIELD.....	Moorhead.
EW PETERSON ..	Waconia.
ES LUEDLOFF ..	Carver.
YLOR.....	Forestville.
VON BAUMBACH.....	Alexandria.
DAY.....	Farmington.

GENERAL FRUIT COMMITTEE.

Y CORP.....	Hammond.
MICHENOR.....	Etna.
KRAMER.....	La Crescent.
SAUNDERS.....	Granite Falls.
NORWOOD.....	Balaton, Murray county.
BUNNELL.....	Newport.
STUBBS.....	Long Lake.
AM McHENRY ..	St. Charles.
LORD.....	Minnesota City.
NCE WEDGE.....	Albert Lea.
E. E. CASE ..	St. Peter.
LER.....	Sumter.
FULLER.....	Litchfield.
DAY.....	Farmington.
ES LUEDLOFF.....	Carver.
BRIMHALL.....	St. Paul.
UDLOW.....	Worthington.

Members of the General Fruit Committee are expected to report separately on all matters of horticulture, but more especially to bring to the notice of the Society new and improved

COMMITTEE ON LEGISLATION.

WYMAN ELLIOT.....	Minneapolis.
PROF. E. D. PORTER.....	St. Anthony Park.
J. T. GRIMES.....	Minneapolis.

COMMITTEE ON SEEDLING FRUITS.

J. S. HARRIS.....	La Crescent.
A. W. SIAS.....	Rochester.
G. W. FULLER.....	Litchfield.

COMMITTEE ON APPLES, PEARS AND PLUMS.

J. S. HARRIS.....	La Crescent.
CHAS. A. KEFFER.....	Brookings, Dak.
ISAAC GILPATRICK.....	Minneapolis.

COMMITTEE ON NATIVE FRUITS.

O. M. LORD.....	Minnesota City.
OLIVER GIBBS, JR.....	Ramsey, Dak.
J. O. BARRETT.....	Browns Valley.

COMMITTEE ON RUSSIAN APPLES.

CHARLES LUEDLOFF.....	Carver.
A. W. SIAS.....	Rochester.
A. PETERSON.....	Waconia.

COMMITTEE ON GRAPES AND SEEDLINGS.

R. KNAPHEIDE.....	St. Paul.
A. W. LATHAM.....	Excelsior.
M. PEARCE.....	Minneapolis.

COMMITTEE ON GRAPE DISEASES.

J. S. HARRIS.....	La Crescent.
A. W. LATHAM.....	Excelsior.
CHARLES LUEDLOFF.....	Carver.

COMMITTEE ON EXPLORATION FRUITS AND FLOWERS.

PROF. E. D. PORTER.....	St. Anthony Park.
S. D. HILLMAN.....	Minneapolis.
A. W. SIAS.....	Rochester.

COMMITTEE ON FORESTRY.

PROF. P. P. SCHOTZKA.....	Minneapolis.
C. L. SMITH.....	Minneapolis.
J. W. BOXELL.....	St. Paul.

COMMITTEE ON EVERGREENS.

GRIMES.....	Minneapolis.
BRAND.....	Faribault.
HUNTER.....	Sioux Falls, Dak.

COMMITTEE ON DECIDUOUS TREES AND SHRUBS.

V. S. CLEVELAND.....	Minneapolis.
EMERY.....	Lake City.
HOAG.....	Minneapolis.

COMMITTEE ON FRUIT BLOSSOMS.

E. D. PORTER.....	St. Anthony Park.
P. PEPPER.....	Pewaukee, Wis.
HARRIS.....	La Crescent.

COMMITTEE ON GREENHOUSES AND HOTBEDS.

MENDENHALL.....	Minneapolis.
CUZNER.....	Agricultural College, Minneapolis.
H & DARLING.....	Winona.

COMMITTEE ON FLORICULTURE.

C. O. VAN CLEVE.....	Minneapolis.
M. S. GOULD.....	Excelsior.
ANNA B. UNDERWOOD.....	Lake City.

COMMITTEE ON NOMENCLATURE.

V. SIAS.....	Rochester.
HARRIS.....	La Crescent.
WILCOX.....	Hastings.

COMMITTEE ON SMALL FRUITS.

BELL.....	Sioux Falls, Dak.
L. ASIRE.....	Minneapolis.
GOULD.....	Excelsior.

COMMITTEE ON VEGETABLE GARDENING.

LIAM LYONS.....	Minneapolis.
UA ALLYN.....	Red Wing.
D. BUSCH.....	Richfield.

COMMITTEE ON MARKETING AND NEW HORTICULTURAL APPLIANCES.

GOULD.....	Excelsior.
PEARCE.....	Minneapolis.
LIAM H. BRIMHALL.....	St. Paul.

COMMITTEE ON HONEY AND SYRUP.

WILLIAM URIE.....	Minneapolis.
WILLIAM DANFORTH.....	Red Wing.
SETH H. KENNEY.....	Morristown.

COMMITTEE ON BREAD AND CAKE.

MRS. WILLIAM H. BRIMHALL.....	St. Paul.
MISS M. ESTELLE PORTER.....	St. Anthony Park.
MISS MARY GRIMES.....	Minneapolis.

COMMITTEE ON PICKELS, PRESERVES AND CANNED
GOODS.

MRS. E. J. STAGER.....	Sauk Rapids.
MRS. O. C. GREGG.....	Minneapolis.
MRS. WILLIAM LYONS.....	Minneapolis.

COMMITTEE ON ENTOMOLOGY.

PROF. O. W. OESTLUND.....	Minneapolis.
R. J. MENDENHALL.....	Minneapolis.
J. S. HARRIS	La Crescent.

ANNUAL MEMBERS.

ALLYN, JOSHUA	Red Wing.
ANDREWS, J. P.....	Faribault.
AUSTIN, L. E.....	Leola, Dak.
BARRETT, J. O.....	Browns Valley.
BERG, C. L.....	Wegdahl.
BOXELL, J. W.....	St. Paul.
BRAND, NORTON F.....	Faribault.
BRAND, O. F.....	Faribault.
BRIMHALL, WILLIAM H.....	St. Paul.
BROWN, C. F.....	St. Peter.
BUNNELL, M. C.....	Newport.
BUSSE, H. F.....	Minneapolis.
COOK, DEWAIN.....	Windom.
CORP, SIDNEY.....	Hammond.
CROSS, MRS. E.	Sauk Rapids.
CUTLER, MILON.....	Sumter.
CUZNER, E. A.....	Minneapolis.
DANFORTH, WILLIAM.....	Red Wing.
DARTT, E. H. S.....	Owatonna.
DAY, DITUS.....	Farmington.
DEVOL, W. S.....	Columbus, Ohio.
DOUGHTY, J. COLE.....	Lake City.

DEERS, G. H.	Chowan.
F. A.	Sauk Rapids.
ELAND, THOMAS.	Stonewall, Man.
ER, G. W.	Litchfield.
ERT, FRED A.	Beardsley.
ERE, H.	Georgetown, Wis.
TRICK, ISAAC	Minneapolis.
D, G. B.	Minneapolis.
D, F. G.	Excelsior.
D, MRS. M. S.	Excelsior.
J. S.	Minneapolis.
ERSON, CHARLES.	Worthington.
, ROBERT.	Minneapolis.
, PROF. C. W.	Minneapolis.
INGTON, G. W.	Plainview.
AN, A. C.	Minneapolis.
OG, PHILIP	Minneapolis.
IAN BROS	Minneapolis.
IAN, S. D.	Minneapolis.
IS, EUGENE E	La Crescent.
IS, FRANK I	La Crescent.
ON, E. D.	Minneapolis.
ON, GEORGE R.	Manchester, N. H.
EY, SETH H.	Morristown.
ER, J. C.	La Crescent.
AM, A. W.	Excelsior.
AM, R. A.	Excelsior.
ETT, GEORGE	Lake City.
ELOFF, CHARLES.	Carver.
H. A.	Maple Ridge.
B, MISS JULIA.	Minneapolis.
B, WILLIAM.	Minneapolis.
ENRY, S. A.	St. Charles.
NTOSH, WILLIAM.	Langdon.
OOD, ARMOUR.	Stonewall, Man.
IN, WILLIAM L.	Smith's Mill.
, L. D.	Garden City.
WELL, G. A.	Minneapolis.
E, J.	Sumter.
Y, A.	Madison, Dak.
UIST, JOHN.	Red Wing.

OWEN, S. M	Minneapolis
PARKER, W. L	Farmingdale
PARTRIDGE, SAM	Moorehead
PETERSON, ANDREW	Waconia
POND, C. H.	Kasson
POOR, HAMLIN V.	Bird Island
PORTER, PROF. EDWARD D.	St. Anthony
PORTER, J. F.	Red Wing
PUFFER, DR. F. L.	Bird Island
ROGERS, G. A.	Red Wing
SCHOTZKA, PROF. P. P.	Minneapolis
SHIRK, DR. J. K.	Lancaster
SMITH, CYRUS L.	Minneapolis
SMITH, FLORENCE	Cresbard
SMITH, MISS GRACE L.	Minneapolis
SMITH, JAMES	Cresbard
SMITH, S. B.	Minneapolis
SOMERVILLE, WILLIAM	Vermillion
STEINERSON, H.	Madison
STAGER, MRS. E. J.	Sauk Rapids
STRANDWOLD, O.	Trysil
STUBBS, N. J.	Long Prairie
TERRY, ALFRED	Slayton
UNDERWOOD, MRS. ANNA B.	Lake Park
UNDERWOOD, J. M.	Lake Park
URIE, WILLIAM	Minneapolis
VARLEY, C.	Big Lake
WENTWORTH, DR. F. H.	Cresbard
WHITE, J. H.	Crow Lake
WILCOX, ARCHIE N.	Hastings
WILCOX, BURTON T.	Hastings
WILCOX, L. H.	Hastings
YOUNG, H. H.	St. Louis

HONORARY MEMBERS FOR FIVE YEARS.

EDSON GAYLORD, from 1886	Nora Springs, I.
J. E. CORLETT, from 1887	Farmersburg, I.
B. S. HOXIE	Evansville,
H. R. HUNTER	Sioux Falls,
C. H. BRETT	Henry,
J. S. B. THOMPSON, from 1888	Grundy Center, I.
MISS EDITH A. KELLOGG	Janesville,

HONORARY LIFE MEMBERS

MARSHALL P. WILDER (deceased)	Boston, Mass.
JOHN P. WARDER (deceased)	North Bend, Ohio.
P. A. JEWELL (deceased)	Lake City.
L. B. HODGES (deceased)	St. Paul.
V. HUMPHREY (deceased)	Faribault.
CHARLES HOAG (deceased)	Minneapolis.
N. J. COLMAN	St. Louis, Mo.
GEORGE P. PEPPER	Pewaukee, Wis.
PLUMB	Milton, Wis.
I. SMITH	Green Bay, Wis.
VILCOX	La Crosse, Wis.
F. J. L. BUDD	Ames, Iowa.
CHARLES GIBB	Abbotsford, Quebec.
F. TUTTLE	Baraboo, Wis.
K. PHOENIX	Delavan, Wis.
V. MANNING	Boston, Mass.
J. W. MANNING	Boston, Mass.
WM. PAIST	Hersey
CHARLES Y. LACEY	Fort Benton, M. T.
J. H. STEVENS	Minneapolis.
HARRIS	La Crescent.
MENDENHALL	Minneapolis.
V. S. CLEVELAND	Minneapolis.
MAN M. SMITH	San Diego, Cal.
I. FORD	San Diego, Cal.
MAN ELLIOT	Minneapolis.
GRIMES	Minneapolis.
V. SIAS	Rochester.
ER M. GIDEON	Excelsior.
WEALTHY GIDEON	Excelsior.
PEARCE	Minneapolis.
D. A. ROBERTSON	St. Paul.
COTTERELL	Dover.
CHARLES LEUDLOFF	Carver.
ER GIBBS, JR.	Ramsey, Dak.
BREW PETERSON	Waconia.
C. O. VAN CLEVE	Minneapolis.
JAMES BOWEN	Minneapolis.
IDA E. TILSON	West Salem, Wis.
H. B. SARGEANT	Lake City.
SARAH MANNING	Lake City.

OFFICERS
OF THE
Minnesota State Agricultural Society
FOR THE YEAR 1888.

PRESIDENT.

WM. R. MERRIAM.....St. L.

VICE PRESIDENTS.

F. C. PILLSBURY, FirstMinneapolis
JAMES McHENCH, Second.....Fairbault

SECRETARY.

H. R. DENNYHam

TREASURER.

F. J. WILCOX.....North

BOARD OF MANAGERS.

JOHN F. NORRISH.....Hast
CLARKE CHAMBERSOwat
JOHN COOPER.....St. C
A. N. JOHNSONBer
L. H. PROSSER.....Wy
C. N. COSGROVE.....Le S

The next annual fair will be held on the State Fair grounds between Minneapolis and St. Paul, Sept. 10 to 15, 1888. No effort will be spared to make it the best agricultural and horticultural exposition of the year.

Much more liberal premiums offered in every department than ever before. For further information address the secretary, as above.

CONSTITUTION

OF THE

MINNESOTA HORTICULTURAL SOCIETY

ARTICLE I.

NAME.

This Society shall be known as the Minnesota State Horticultural Society.

ARTICLE II.

OBJECT OF THE SOCIETY.

The object of this Society shall be to improve the condition of poultry, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, and other productions in horticulture as are adapted to the soil and climate of Minnesota.

ARTICLE III.

MEMBERSHIP.

Any person may become a member by paying to the secretary or treasurer an annual fee of one dollar, or a life member by the payment of ten dollars. Honorary members, for a time stated or for life, may be elected at any annual meeting by a two-thirds vote of the Society, and shall be entitled to all the rights and privileges of membership; provided, that honorary life members may pay a fee of ten dollars, in lieu of equal annual payments of five dollars.

ARTICLE IV.

OFFICERS.

Its officers shall consist of a president and one vice president for each congressional district, a secretary, treasurer, and an executive committee of five, and librarian.

ARTICLE V.

DUTIES OF PRESIDENT AND VICE PRESIDENTS.

The president shall preside at and conduct all meetings of the Society, and deliver an annual address, and in his absence the vice president, in their order, shall perform the same duties. They shall also have the general supervision of the horticultural interests in their respective districts, and make a written report to the Society at its annual meeting; in consideration of which the Society shall pay their traveling expenses to the same.

ARTICLE VI.

THE SECRETARY.

The secretary shall record all the doings of the Society, collate, prepare all communications, etc., for the public press, and pay out all moneys received from members or otherwise to the treasurer on receipt; receive and answer all communications addressed to the secretary, establish and maintain correspondence with all local, congressional district and state horticultural societies, and secure by exchange all transactions, as far as possible; to aid the president as an executive officer in the dispatch of business relating to the meetings of the Society; to give notice of horticultural and similar meetings of general interest; to report to the annual meeting of the Society an abstract of the matters that has come into his possession, which, with its approval, shall become part of its transactions of the current year.

ARTICLE VII.

THE TREASURER.

The treasurer shall collect and hold all funds of the Society, and pay out the same only on the order of the president, countersigned by the secretary. He shall make up a report of all the receipts and disbursements.

of the Society, and present the same at the annual winter meeting any other time when called upon to do so by the executive committee. He shall give bonds in such sum as the Society may direct, approved by the president and secretary, and the bond when so made shall be filed with the state auditor.

ARTICLE VIII.

ELECTION OF OFFICERS.

Officers shall be elected separately and annually by ballot, and their office until their successors are elected.

ARTICLE IX.

MEETINGS OF THE SOCIETY.

Society shall hold annual sessions on the third Tuesday of January and other meetings at such time and place as the Society may

ARTICLE X.

THE LIBRARIAN.

Librarian shall have charge of the library and report its condition each annual meeting.

ARTICLE XI.

AMENDMENTS.

Laws and alterations of the constitution for the purpose of meeting the further wants of the Society, may be enacted by a vote of two-thirds of the members present at any regular annual meeting, and on five days' notice of the same being given.

BY-LAWS.

1. The president, at each annual meeting of the Society appoint a general fruit committee, consisting of two members each congressional district in the State, and it shall be the duty of each member to make a written report annually upon the fruit raised in his district and a limited list of fruits best adapted for general cultivation in his respective districts.

2. The president, secretary and treasurer shall be members *ex officio* of the executive committee, who shall have charge of all matters pertaining to the interests of the Society.

3. The executive committee may call a meeting of the Society at any time they may deem advisable, giving at least thirty days' notice through the public press.

4. The executive committee shall appoint a committee on nomenclature, on forestry, on fruit blossoms, on rural apples, on gardening, on small fruits, and on floriculture.

5. The five members of the executive committee, not including the president, secretary or treasurer, shall be a committee on finance, and it shall be their duty to audit all bills before they shall be ordered by the president and secretary.

6. The executive committee shall see that a program is issued at each meeting of the Society, at least one month before the winter meeting and ten days before the summer meeting.

7. Every member shall be entitled to one copy of the transactions as often as published, on which postage shall be paid; but in the distribution of all other copies the party receiving the same shall pay postage. Where several copies are sent to auxiliary societies it shall be discretionary with the secretary to pay the freight.

8. *Quorum*.—A quorum shall consist of nine members of the Society, or a majority of the executive committee.

MINNESOTA STATE HORTICULTURAL SOCIETY.

TRANSACTIONS 1887-8.

TWENTY-FIRST ANNUAL MEETING.

MARKET HALL, MINNEAPOLIS, TUESDAY, WEDNESDAY, THURSDAY
AND FRIDAY, JANUARY 17, 18, 19 AND 20, 1888, IN JOINT
SESSION WITH STATE AMBER CANE ASSOCIATION.

*NOTE.—This Society will not be held responsible for individual opinions which are
in this report.—Secretary.*

Following is the circular sent out announcing the annual winter
meeting of the Society:

Twenty-first Annual Winter Meeting of the State Horticultural Society will
be held at Minneapolis, on January 17th to 20th, inclusive, 1888, the State Amber
Cane Association occupying the time for its Eleventh Annual Session on the after-
noon of Wednesday, January 18th.

Cordial invitation is extended to kindred organizations in other States, as well
as those of Local Societies, to send delegates to the meetings, which are *free to all*.
Members are especially invited to attend and take part in the exercises.

Members are especially urged to be present and to render such assistance as
may be necessary to make the session one of interest and profit. If you have suc-
cess in growing fruit come and tell us about it, or if you wish to know more
about it come and ask questions. We want a lively and wide awake session.

Members of special and standing committees are expected to report in person or
by manuscript; let the same be brief and to the point. This is important as indi-
cating what progress is being made in fruit and vegetable culture throughout the

Liberal premiums will be given for exhibits of fruits, flowers and vegetables, etc., but not on inferior or unworthy articles, even if there is no competition. It is hoped that a large exhibit may be made.

SPECIAL PREMIUMS FOR ESSAYS.

The Society offers the following special prizes for essays from young men and women under twenty-five years of age:

Best essay on "Orcharding for Minnesota,"	\$25 00
Best essay on "Grape Growing in Minnesota,"	25 00
Best essay on "Strawberries and Raspberries in Minnesota,"	25 00
Best essay on "Blackberries and Dewberries in Minnesota,"	25 00
Best essay on "Currants and Gooseberries in Minnesota,"	25 00

The following lines of railway will return delegates at reduced rates of fare, to wit: St. Paul & Duluth Railway, one-third fare; the Northern Pacific Railroad and the Minneapolis & Pacific Railways, at one-fifth fare, provided receipts are obtained from station agents at starting points, showing full fare has been paid one way.

The following lines of railway will return delegates upon the certificate plan, to points within the State, at one-third fare, to wit: Chicago, Milwaukee & St. Paul Railway, Chicago & Northwestern Railway, Chicago, St. Paul, Minneapolis & Omaha Railway, St. Paul & Kansas City Railway, Minneapolis & St. Louis Railway and the Burlington and Northern Railroad.

Delegates on purchasing a full fare ticket going, will secure at the same time from the station agent a Delegate's Convention Receipt or Certificate specifying that such ticket has been purchased, which receipt, on being properly filled out and signed by the secretary of the Society, and presented to the local railway agent at Minneapolis, will authorize the return of the delegate at the reduced rates, provided such certificate is presented on or before Jan. 23, 1888.

Where delegates pass over two or more railways en route to the meeting and do not obtain through tickets, they should procure receipts for the full fare paid each line, for each ticket purchased, as separate return tickets will be issued by each company. Such tickets are provided by the Chicago & Northwestern Railway at Winona, Dodge Center, Owatonna, Waseca and Kasota.

Members in attendance from a distance will be provided with entertainment by the local committee on arrangements.

For further particulars address

S D. HILLMAN, *Secretary*,

MINNEAPOLIS.

WYMAN ELLIOT, *President*,

MINNEAPOLIS.

State Horticultural Society.

PROF. E D. PORTER, *Secretary*,

ST. ANTHONY PARK

State Amber Cane Association

RUSSELL BLAKELEY, *President*,

ST. PAUL.

PROGRAM.

following order will be adhered to as near as circumstances will permit, but
e varied from time to time as the Society may deem best.

FIRST DAY—TUESDAY, JANUARY 17, AT 10 A. M.

ing Exercises. Arrangements of Exhibits and Reception of Members.

ointment of Committees. Committees on Fruit List; on Award of Premiums;
olication; on Final Resolutions; on Obituary.

AFTERNOON SESSION—AT 2 P. M.

ress of Welcome. Isaac Atwater, President Board of Trade.

onns to Address of Welcome. E. H. S. Dartt, Owatonna.

orts from Local Societies. Hennepin County Horticultural Society, Prof. L.
Secretary, Minneapolis; Olmsted County Horticultural Society, M. J. Hoag,
ster; Minnesota Valley Horticultural Society, A. B. Regester, Granite Falls;
Side Horticultural Society, A. S. Crossfield, Browns Valley; McLeod County
ultural Society, H. I. Corson, Glencoe; Ramsey County Agricultural and
ultural Society, Adam Bobland, St. Paul.

espondence, etc.

icultural Experiment Stations and how to conduct them. E. H. S. Dartt,
onna.

ussion on same.

tion Box.

EVENING SESSION—AT 7 P. M.

ident's Annual Address. Wyman Elliot, Minneapolis.

pe Culture. N. J. Stubbs, Long Lake.

Tree Peddler. A. W. Sias, Rochester.

SECOND DAY—WEDNESDAY, JANUARY 18, AT 9 A. M.

rt of Seedling Commission. John S. Harris, La Crescent; G. W. Fuller,
eld; A. W. Sias, Rochester.

rt of Committee on Native Fruits. O. M. Lord, Minnesota City.

rt of Committee on Russian Apples. Chas. Luedloff, Carver.

ussion on same.

ing Houses for Vegetable Culture in Winter. J. S. Gray, Minneapolis.

AFTERNOON SESSION—AT 2 P. M.

Eleventh Annual Meeting of the State Amber Cane Association.

utes of Last Meeting Read.

ption of Members.

rt of Secretary and Treasurer.

tion of Officers.

ointment of Committees.

ident's Address. Russell Blakeley, St. Paul.

rovements in Machinery and Process of Manufacture. B. Densmore, Red Wing.

ment Condition of the Amber Cane Industry. Seth H. Kenney, Morristown.

orts from Growers and Manufacturing of Amber Cane.

rt from Station at Fort Scott, Kas. M. Swenson, Director.

ussion.

EVENING SESSION—AT 7 P. M.

Music.

Street and Lawn Planting with Trees and Ornamental Shrubs. H. W. S. Cleveland, Minneapolis.

Sanitary Management of Cities as Related to Horticulture, or, the Disposal of City Cleanings. Lecture by Prof. Wm. W. Folwell, of State University.

Governor McGill has promised to be present and to address the Society briefly.

THIRD DAY—THURSDAY, JANUARY 19, AT 9 A. M.

Annual Report of Secretary

Annual Report of Treasurer.

The Culture of Small Fruits. Wm. Danforth, Red Wing.

Report of Committee on Small Fruits.

Discussion on Same.

Culture of the Dewberry. De Wain Cook, Windom.

Five Minute Papers on Vegetables. By Practical Gardeners.

Early Beets and Tomatoes. Joshua Allen, Red Wing.

Report of Finance Committee.

AFTERNOON SESSION—AT 2 P. M.

Principles of Drainage as Related to Horticulture. Rufus Cook, Minneapolis.

Ad Interim or District Reports, by Vice-Presidents of the Society. A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; M. Cutler, Sumter; N. J. Stubbs, Long Lake; G. W. Fuller, Litchfield.

Annual Election of Officers. By Ballot.

Value of Evergreens. O. F. Brand, Faribault.

Report of Committee on Evergreens.

Report of Committee on Forestry.

Scaler's Experience in Northern Pineries. J. W. Eastman, Minneapolis.

Report of Work of State Forestry Association. C. L. Smith, Minneapolis.

Discussion on Same.

EVENING SESSION—AT 7 P. M.

Music.

Report of Committee on Floriculture. Mrs. C. O. Van Cleve, Minneapolis; Mrs. Anna B. Underwood, Lake City; Mrs. M. S. Gould, Excelsior.

Amateur Flower Garden. Frank H. Carleton, Minneapolis.

Entomologist's Report. Prof. O. W. Oestlund, Minneapolis.

Early Experience in Orchardng in Minnesota. Prof. W. W. Pendergast, St. Paul.

FOURTH DAY—FRIDAY, JANUARY, 21ST, AT 9 A. M.

The Apple; What may we reasonably expect of it in Minnesota. O. F. Brand, Faribault.
Reports from Experimental Stations:

F. D. PORTER, St. Anthony Pk. CHARLES LUEDLOFF, Carver.

PETER M. GIDEON, Excelsior.

UNDERWOOD & EMERY, Lake City.

M. PEARCE, Minneapolis.

B. TAYLOR, Forestville.

G. W. FULLER, Litchfield.

FRED VON BAUMBACH, Alexandria.

A. W. SIAS, Rochester.

E. H. S. DARTT, Owatonna.

R. M. PROBSTFIELD, Moorhead.

L. E. DAY, Farmington.

F. J. SCHREIBER, Moorhead.

J. S. HARRIS, La Crescent.

ANDREW PENDERGAST, Waconia.

O. M. LORD, Minnesota City.

of General Fruit Committees :

DNEY CORP, Hammond.	CLARENCE WEDGE, Albert Lea.
K. MICHENOR, Etna.	GEORGE E. CASE, St. Peter.
C. KRAMER, La Crescent.	M. CUTLER, Sumter.
E. SAUNDERS, Granite Falls.	G. W. FULLER, Litchfield.
F. NORWOOD, Balaton.	L. E. DAY, Farmington.
C. BUNNELL, Newport.	CHARLES LUEDLOEF, Carver.
J. STUBBS, Long Lake.	W. E. BRIMHALL, St. Paul.
WILLIAM MOHENRY, St. Charles.	M. T. DUNCAN, Fergus Falls.
M. LORD, Minnesota City.	H. J. LUDLOW, Worthington.

Discussion on Same.

on Plums. D. B. Wier, Lacon, Ill.

*Reports of Special Fruit Committees on Fruit Lists.**Report of Committee on Award of Premiums.**Report of Committee on Nomenclature.*

AFTERNOON SESSION—AT 2 P. M.

on the Training and Moral Influence of Flowers. Robert Hale, Minneapolis.

on the Culture of Forests. J. O. Barrett, Browns Valley.

Reports of Special Committees.

Report of Committee on Legislation. Prof. E. D. Porter, St. Anthony Park.

*Report of Committee on Final Resolutions.**Business of Next Meeting.**Unfinished Business.**Adjournment.*

PREMIUM LIST.

WM. H. BRIMHALL, ST. PAUL, SUPERINTENDENT OF EXHIBITS.

APPLES.

(All Plates to consist of five specimens.)

Collection of Minnesota apples, including hybrids, first premium, \$5; second, \$2.

Display of Wealthy, first premium, \$3; second, \$2; third, \$1.

Plate of winter apples, any variety, first premium, \$2; second, \$1.

Plate of winter varieties Russian apples, first premium, \$2; second, \$1.

Plate of hybrids, first premium, \$2; second, \$1.

GRAPES.

Display of native grapes, in good condition, first premium, \$5; second, \$3.

Plate, any variety, first, \$3; second, \$2.

Display of fruit in glass jars, first premium, \$5; second, \$3.

PLANTS AND FLOWERS.

	1st Prem.	2d Prem.
Best display ornamental and flowering plants.....	\$5 00	
Best display of roses in pots.....	2 00	
Best display of geraniums.....	2 00	
Best single plant in bloom.....	2 00	
Best display begonias.....	2 00	
Best display carnations.....	2 00	

CUT FLOWERS.

- Best and most artistically arranged design, first premium, \$5; second, \$3.
 Best collection of roses, first premium, \$3; second, \$2.
 Best hand bouquet, first premium, \$3; second, \$2.
 Best cultivated cranberries, provided a history of their cultivation be furnished, first premium, \$5; second, \$3; third, \$2.

VEGETABLES.

	1st Prem.	2d Prem.
Best display.....	\$5 00	
Best half peck early potatoes.....	2 00	
Best half peck potatoes for winter and spring.....	2 00	
Best half peck onions.....	2 00	
Best half peck turnips.....	2 00	
Best half peck beets.....	1 00	
Best half peck parsnips.....	1 00	
Best half peck carrots.....	1 00	
Best Hubbard squash.....	1 00	
Best six bunches celery.....	1 00	
Best winter cabbage.....	1 00	

SEEDS.

- Best display of Minnesota garden seeds, first premium, \$5; second, \$3.

PANTRY STORES.

- Best display canned fruits, \$3; second best, \$2.
 Best display of jellies, \$2; second best, \$1.
 Best jar mixed pickels, \$1; second best, 50 cents.
 Best sample home-made vinegar, \$1; second best, 50 cents.
 Best sample comb honey, \$1; second best, 50 cents.
 Best sample strained honey, \$1; second best, 50 cents.

WORKS OF ART.

- Collection of paintings, fruits and flowers, first premium, \$5; second, \$3.
 Best single fruit painting, \$3; second best, \$2.
 Display garden tools and horticultural implements. Certificate of honor on mention.

Exhibitors are expected to make their entries the first day. All exhibits must be in place by 10 o'clock, A. M., the second day.

Competition shall be open to all, but it is expected that the annual membership fee (\$1) will be contributed unless exhibitors are members of the Society. Members are entitled to bound copies of the Transactions.

MINNESOTA STATE HORTICULTURAL SOCIETY.

ANNUAL WINTER MEETING.

MARKET HALL, MINNEAPOLIS, TUESDAY, WEDNESDAY, THURSDAY
AND FRIDAY, JANUARY 17, 18, 19, AND 20, 1888, IN JOINT
SESSION WITH STATE AMBER CANE ASSOCIATION.

The twenty-first annual winter meeting of the State Horticultural Society, held at Market Hall, Minneapolis, convened on Tuesday morning, Jan. 17, 1888. The meeting was called to order shortly before 1 o'clock, by the President, Wyman Elliot, of Minneapolis. A prayer was offered by Prof. G. E. McLean, of the State University, Minneapolis.

President Elliot announced the following committees:

Committee on Award of Premiums: M. C. Bunnell, Newport; J. S. Sias, La Crescent; Mrs. M. S. Gould, Excelsior.

Committee on Fruit Lists: A. W. Sias, Rochester; J. S. Harris, La Crescent; M. Pearce, Minneapolis.

Committee on Final Resolutions: Col. J. H. Stevens, Minneapolis; J. Sias, Rochester; G. W. Fuller, Litchfield.

Committee on Obituary: J. S. Harris, La Crescent; C. L. Smith, Minneapolis; S. D. Hillman, Minneapolis.

Committee on Publication: Col. J. H. Stevens, of Minneapolis; the President and Secretary.

President Elliot stated it would perhaps be proper to name committee on Award of Premiums on Essays.

M. Pearce. So far as the essays are concerned I think it is better to have them read and awards made by the Society as a whole.

J. S. Harris If there is time to have them read carefully that would

answer; but I think a committee can arrive at a decision by time better than the Society could do from simply hearing them.

President Elliot. I am aware that there was delay in awarding prize on essays at a former meeting; but I think committees can be secured that will act promptly and perform the work with acceptance. The appointment of those committees will be deferred for the present.

Prof. McLean stated that owing to engagements at the university he would be obliged to retire. He hoped the members of the Society would find time to visit the State University for the purpose of observing the methods pursued in the different departments of that institution, where they would be welcome at any time.

The resignation of Treasurer Grimes was announced, and, in its place, William H. Brimhall, of Hamline, was appointed Treasurer *pro tempore*. The balance of the forenoon was devoted to the arrangement of exhibits, etc.

The meeting adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

TUESDAY, JAN. 17, 1888.

The meeting was called to order by President Elliot at 2 o'clock.

The attendance of delegates was much larger than expected, considering the severity of the weather of the preceding week, and the blockaded condition of the railroads and the public highways in the country. The temperature ranged some twenty-five or thirty degrees higher than for several days preceding the meeting. The number of members present at the opening session gave evidence of a warm interest and a successful meeting.

A large and very fine display of flowers and exotic plants was made by the Mendenhall Greenhouse. But few other entries were made during the first day's session.

ADDRESS OF WELCOME.

Hon. Isaac Atwater, president of the Minneapolis Board of Trade, was introduced and delivered the following Address of Welcome.

Mr. President and Gentlemen of the State Horticultural and Aromatic Cane Associations:

I feel especial pleasure in that I have the honor, on behalf of the citizens of Minneapolis, to welcome you to our city to hold your

ations. I hope you will not take this as a mere formal expression of courtesy, usual on such occasions, for I know of no association of men or women whose aims and occupations are more nearly related to the highest interests of our city—and when I say city I include the State—than those which you represent.

As you are aware, our beautiful city, thus early in her history, has already become somewhat famous for her conventions. The disciples of all professions—theology, medicine, law, agriculture, the arts and sciences—all here find their favorite place of rendezvous; nay, indeed, the ambitious have our people become in this direction, that lately, as you are aware, they even attempted to capture one of the largest political parties of the country, to hold its convention in this city. The attempt, however, was unsuccessful. But had it been otherwise, I think if the expenditure of time and money, and I may add spiritual comforts, would have inured an hundred-fold more to the interests of the city and State, had it been devoted to the development of the industries you represent.

Gentlemen, the city of Minneapolis has cause to feel proud that you are here to-day with your presence. Your discussions it may be true to some extent to your personal interest, but this city and this State will gain an hundred-fold more than you yourselves.

You are the men who, by patience, intelligence, skill and energy, have been placed on our tables as appetizing fruits as any reasonable man could desire—as beautiful flowers as Paradise can offer—and delicious tastes, scarcely inferior to those of Cuba.

As we already know. We know that even the simple parlor of the busy man may be adorned all the dreary winter long with flowers which make his home a lovely summer. We know that the growers of the Sugar Cane have placed the sweets of the tropics in many a humble home which could not otherwise have been enjoyed. Your efforts thus far should satisfy you, and yet with the true old Anglo-American spirit, you thirst for more.

What a mighty revolution has your skill, intelligence, untiring industry and patience wrought in this great Northwest within the last twenty-five years! When, in 1850, I came to this State from New England, no one there believed that anything except the most hardy vegetables, such as cabbage, potatoes and turnips, could here be raised. Nor two of the small grains, as oats and buckwheat, might sometimes be relied on to get through. For the rest, lumber and furs were considered to be the only sources of industry. No fruits and flowers were ever to be seen. It was a veritable Botany Bay, to which we, who

had committed no crime, were sentenced for life. We accepted our sentence. We entered upon our several occupations. We lawyers engaged in our profession. We waited long weary days for clients. The flies did not walk into our chamber. But you, more fortunate, sought nature in her still retreats. She was coy, and long withheld her gracious gifts. But by your perseverance, by your skill and patience, you have demonstrated that Nature is no less kind in the forty-fifth parallel of latitude than in the thirtieth.

But, gentlemen, in welcoming you to this city, what have we to give in return, in comparison with what you give us? I may say almost absolutely nothing. True, we can show you half a dozen theatres running day and night—especially at night. We have churches on almost every street, with every phase of theology, and some with no theology at all [laughter]; half a dozen courts constantly running to dispense justice. Lectures on every science and subject under the sun; and musical concerts by artists who think themselves the equals of those of European fame. But all this is that for which you do not seek. And had we known in time you were to honor us with your presence here to-day we would have erected an ice palace for your delectation, the magnificence of which, as compared with that in our sister city, should have been as the splendor of the sun to the feeble light of the moon. [Laughter.]

Gentlemen, I am detaining you, you are men of business, we of theory. Indeed, it does not seem quite appropriate that a professional man should welcome those so entirely practical as yourselves to our city. But I beg you to believe that I am such, is rather my misfortune than my fault. If you will pardon me a word I will tell you how it happened. I was brought up on a farm, and was blessed, as I suppose all of us were, with poor but honest parents. My earliest infantile aspirations were to become a practical bonanza farmer, like our friend, J. J. Hill, of St. Paul, or a famous horticulturist or Amber cane grower. In pursuit of this ever present idea, at the age of ten or eleven, I discovered a scythe hanging in my father's barn, and was ambitious to demonstrate my ability as a mower. The grass was tempting in the door-yard, and I proceeded to lay it low, together with quite a number of choice shrubs and flowers which had recently been set near the grass plat. At this juncture my paternal ancestor appeared on the scene. His look was ominous, and he said, "Isaac, did you do that?" Like the immortal Washington, I could not tell a lie, especially as I had been caught in the very act. [Laughter.] I was told to go and put up the scythe. Then did the old Adam rise in my

ent young bosom, and hurling the instrument upon an adjoining bed, I said: "If I cannot mow when I am a boy I wont when I am a man." It was an unfortunate remark, taken in connection with previous work. The aforesaid paternal straightway marched me to the barn, and with the aid of a rawhide caused the chilling "snows of winter" to descend on my nether extremities, which caused them to wither and blossom as the rose [laughter], while the neighbors thought the sound that a menagerie had broken loose. It is thus that as I grew I was trained up the wrong way, which, when I become old, I find the straightway "depart from it."

Gentlemen, I will detain you no longer. I trust that your stay in this city may be pleasant, your deliberations harmonious and profitable.

Bidding you, on behalf of our citizens, thrice welcome, I leave you to your further duties. [Applause.]

RESPONSE TO THE ADDRESS OF WELCOME.

H. S. Dartt, of Owatonna, responded on behalf of the Society. He said:

President, Ladies and Gentlemen:

I can say in behalf of our Society that we are not surprised at this friendly greeting. When we have watched a man or a city and have seen them pursuing a straightforward, undeviating course for a long period of time, we come to know about what to expect of them.

Minneapolis has always treated us with that kindness and consideration which we think our cause merits. In the days of our infancy, when we were struggling for existence, when we required that material aid without which great enterprises often fail, two righteous men were found in Minneapolis who rendered that aid and we lived.

Now, sir, it may not be quite right for us to claim that the finding of those two righteous men saved your city, but we know she has since saved to a period of growth and prosperity that is the marvel of beholders, and we believe this wonderful prosperity is largely due to that spirit of liberality among her citizens that "cropped out" so conspicuously in our Horticultural fathers, Wyman Elliot and R. J. Denhall.

Certainly, sir, as has been intimated, we have met with great disappointments. At a very early day L. M. Ford told us we could not successfully grow the common varieties of the standard apples in Minnesota. As a Society we were then in that hopeful period of youth when our trees were in the same period, and we sat down on Ford, A

succession of mild winters brought such encouragement that we were able to place every croaker on the list with Ford. Thrifty young orchards sprang up, and our exhibition tables groaned under their load of luscious apples; and, though the frost king whispered "beware," and croakers thought our trees were struck with death, yet we heeded them not; a shout of victory went up and our fame as an apple-growing State extended as far as Philadelphia and New Orleans.

Alas! in the height of our glory Old Boreas assumed a more savage attitude. He breathed on us with a breath so fierce that it blighted most of our standards and sent the chills to the marrow bones of our faith. He tantalized us with the stigma of being false prophets, and all the Fords seemed to say "Amen! we told you so."

Thus humiliated, what could we do. Should we surrender? *Never*. If we seemed to falter, it was but the feint of the expert wrestler to feel our adversary and concentrate our powers for greater efforts. We will build again on a more substantial foundation, and though the completion of our structure may require a new list of varieties and a new list of laborers, yet the ultimatum of the apple question in Minnesota will be a grand success. And whilst we would profit by our adversities, we may still remember

"And though our toils are hard to bear,
We have of joys an equal share,
And less of envious strife and care, whilst here below."

To-day, a great city comes to do us honor and to strew roses in our pathway. And a generous public says, "with all thy faults we love thee still."

Now, sir, I wish I had a better tongue that I might adequately express our gratitude on this occasion. But the best that I can do is to promise that our Society shall go forward in her efforts to ameliorate the condition of mankind, not only as regards the present generation, but as regards the countless millions that are to come after us; and I promise that she will pursue these labors with a sincerity and an energy that shall do honor to her parentage and merit the continued approval of one of the best, one of the most enlightened and one of the most progressive cities on earth. [Applause.]

REPORTS FROM LOCAL SOCIETIES.

Secretary then read the following report:

REPORT OF THE SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

Secretary of the Minnesota State Horticultural Society:

Before reporting the status of our present society at this place, it seems well to speak briefly of its predecessor.

The Olmsted County Horticultural Society held its last semi-annual meeting June 11, 1887, under a giant cottonwood tree, known as the "Zumbro Chief," standing on the banks of the Zumbro river, about five miles north of the city of Rochester. The tree is said to be the largest in the county. Thirty or forty people were present.

The exhibit of strawberries was probably the finest ever shown in southern Minnesota. A. W. Sias, of this city was the largest exhibitor, showing eight varieties. F. W. Loudon, of Janesville, Wis., showed some fine specimens of the "Jessie," one berry measuring four inches in circumference. Several members took specimens of the "Jessie" to their homes to plant the seeds; and we may expect that Olmsted county will in the near future produce a new strawberry variety, at least, of notice.

A photograph of the berry exhibit and of the people present, with the giant tree in the background, was furnished at a moderate cost to all who desired it. The purpose of the society is hereafter to hold its summer meetings in the vicinity of some noteworthy horticultural object lesson.

The fifteenth annual session of the society was held at the City of Rochester this city, Jan. 7, 1888. Before this meeting it became imprinted upon the minds of some of the members that a change was needed. For, although the society had been in existence for fifteen years, the result of its labors had been anything but satisfactory, and was attributed largely due to the fact that so few workers could be found in the county with interest enough in horticultural matters to share the burdens of carrying on the work of the society that they might reap the benefits of its existence.

Mr. Harris, of La Crescent, an honorary life member of the society, and Mr. Sias, strongly urged the organization of a society with a wider field of action, and thus enlist the interest and

labors of many horticulturalists in other sections of Southern Minnesota.

Opinions concerning the new organization were also elicited from a number of other horticulturalists, including Wyman Elliot, president of the State Society, E. H. S. Dartt, of Owatonna, and J. H. Vandervort, of Mankato. Some of those opinions were adverse and some favorable. Mr. Elliot seemed to think we had better begin by building up township societies subsidiary to the county organization, and they to the State Society. Mr. Dartt was not enthusiastic but said we could count on him for membership fees, etc. Mr. Vandervort, though his letter reached us after the meeting, strongly favored the move, and said, "I am sorry I cannot attend your meeting and help organize that Southern Minnesota Horticultural Society." C. H. Pond sent us encouraging words from Kasson.

But to return to our annual meeting. Two sessions were held which occupied nearly the entire day. The attendance was not large, but those present were there for business.

After calling the meeting to order, President Sias read a letter from Jos. Klinkhammer, of Le Sueur county, on the subject of tree frauds in his county.

The subject of reorganization was then brought up, and letters from President Elliot, of Minneapolis, and J. S. Harris, of La Crescent, were read, followed by a paper from President Sias on the same subject. After some discussion by the members, the following resolution was read and unanimously adopted:

"WHEREAS, The Olmsted County Horticultural Society desires to enlarge and broaden its field of labor and to increase its usefulness by improving the condition of horticulture and kindred topics, and to collect and disseminate correct information concerning the same throughout the southern portion of our State; therefore be it

Resolved, 1. That the Olmsted County Horticultural Society take on the name and be merged in the Southern Minnesota Horticultural Society.

2. That all the property, rights, franchises, assets and liabilities of the Olmsted County Horticultural Society be, and the same hereby are, vested in and assumed by the said Southern Minnesota Horticultural Society.

3. That it shall be the purpose of the Southern Minnesota Horticultural Society to extend its labors to and secure co-operation from all the southern portion of the State of Minnesota."

A new constitution and a new set of by-laws, adapted to the use of

society in its new field of labor, were offered, and, after some discussion, adopted by the society.

S. Harris, of La Crescent, though not present at the meeting, manifested his good will by contributing a paper on the subject of entomology." The paper was mainly devoted to a study of the Headed Apple Tree Borer.

A paper on "Onion Culture" was then read by Wayland Stedman, of this city, which was quite a thorough discussion of the different varieties, the best methods of cultivation, and the profits of the business.

This was followed by a paper on "Orcharding," by Edwin Deacon, of this city; it was mainly devoted to furnishing practical suggestions to the planter, for buying, transplanting, protecting and cultivating his apple trees.

President Sias then read a letter from C. H. Pond, of Kasson, in which he related his experience in fruit growing. He has several peach trees, twenty-five years old, that are still healthy and bearing fruit. He also has some success with the Wealthy, and is quite extensively engaged in small fruit growing. He has now two acres of blackberries, mainly the Ancient Briton.

The following officers were then elected for the ensuing year:

President—A. W. Sias, Rochester.

First Vice-President—J. S. Harris, La Crescent.

Second Vice-President—C. H. Pond, Kasson.

Secretary—Edwin Deacon, Rochester.

Treasurer—Wayland Stedman, Rochester.

Librarian—Mrs. Stansbury, Rochester.

Executive Committee—William Somerville, Viola; E. G. Ballard and John Bamber, both of Rochester.

The annual fee for membership in the new society was fixed by the constitution at fifty cents, and as in the county society heretofore, every member is entitled to a copy of the State Horticultural Report, without additional charge.

Articles of Incorporation were then adopted by the society and placed in the hands of the Executive Committee, with instructions to effect the incorporation.

The society adjourned to meet at the call of the Executive Committee. Dated, Rochester, Minn., Jan. 18, 1888.

EDWIN DEACON, *Secretary*.

The following report was prepared by President Cutler:

MCLEOD COUNTY HORTICULTURAL SOCIETY.

The second annual meeting of the McLeod County Horticultural Society was called to order by the president, Mr. Cutler, at 2 o'clock p. m., at the Methodist church.

Mr. Pearce, of Minneapolis, told how to raise strawberries. His remarks were very interesting and called out many questions from those present.

The secretary being absent, M. W. Clay was elected secretary pro tem. The reports of the secretary and treasurer were read, showing a considerable sum of money on hand, and quite a number of reports of the State Society. Reports accepted.

The election of officers resulted in most of the old officers being retained, as follows:

President—M. Cutler, Sumter.

Vice-President—J. Benjamin, Hutchinson.

Secretary and Treasurer—H. I. Corson, Glencoe.

The date of holding the annual meeting was changed to the first Tuesday in December.

A resolution was passed requesting our representative in Congress to work for a bill reducing postage on books, seeds and plants

Very interesting papers were read on "Grape Growing," by J. S. Harris, of La Crescent, and on "Fruits and Evergreens for the Prairie," by G. W. Fuller, of Litchfield

EVENING SESSION.

In the evening an address was made by M. Pearce, of Minneapolis, subject: "How to grow Raspberries, Blackberries and Grapes without fail," followed by questions and discussions on the same. This was followed by the president's annual address. It called attention to the increased interest which is manifested in horticulture and the promising outlook for the future.

M. T. Ridout, one of the most successful gardeners west of the Big Woods, read a very interesting paper on "Vegetable Growing."

Owing to the extreme cold weather, there was not a very large attendance at the meeting. We have obtained several new members the last season and still hope to have a live and useful society.

HUTCHINSON, MINN., Jan. 11, 1888.

We are indebted to the editor of the Hutchinson *Leader* for a copy of the very interesting address of President Cutler, which is herewith presented.—*Secretary*.

ADDRESS DELIVERED AT THE ANNUAL MEETING OF THE MCLEOD COUNTY HORTICULTURAL SOCIETY.

[From the Hutchinson Leader.]

To Members of the McLeod County Horticultural Society, Ladies
and Gentlemen:

It gives me pleasure on this second anniversary of our organization to note the increased interest that is being taken by our people in fruit culture, forest planting and floriculture. From the woods of the State, from the prairies of Sumter and Lynn, and from the beautiful lakes north of this town—we hear of success in fruit culture. When I commenced the cultivation of fruit for market, about seven years since, a great change has taken place. Then few berries were in the markets and it was hard work to sell the sixteen dollars' worth I had to spare. While the past season the hundred bushels I had for sale did not begin to fill the demand, and hundreds of cases were shipped from the twin cities to towns west of us. As soon as the frosts of winter are gone and our merry songsters return from the South, the queen of berries, the strawberries, makes its appearance in our markets and holds the fort until about the fourth of July.

It has been reported that two million boxes were received in St. Paul and Minneapolis in one season, besides the hundreds of bushels of home-grown berries. Notwithstanding the great increase in production, prices were good and demand better the past season than for the two previous years. The demand for and production of small fruits has increased in the same ratio. Mr. Latham, of Michigan, found a ready market for his eighteen tons of grapes at fair prices. Raspberries and blackberries are being grown by the acre just at your very doors, with as much or more certainty and a little less labor than corn. Yet how few of our people have a supply.

It is the mission of horticultural societies to show the people how to raise these most delicious of fruits, as well as to warn them of humbug and swindling tree-peddlers. Methinks if three-fourths of the money spent in this country for dead apple trees had been spent for good fruit plants and the other fourth for good horticultural books and papers, every family owning land could have plenty of fruit from its own vine and plant. The appetite for fruit is natural, and should be supplied.

Our little two-year old child is sitting at the table; on one side of the plate is a nice dish of berries and a rosy cheeked apple, on the other a plug of tobacco. I need not tell you which it would seize and

devour with eagerness. A great change is taking place in the habits of our people. As the mobbing of Lovejoy and the hanging of Brown presaged the downfall of slavery, so sure does the murder of Rev. Mr. Haddock presage the downfall of the liquor traffic. All the foes of good society and happy homes are on the run and get hard knocks from every quarter. With the decrease of the consumption of intoxicating drink, the demand for the finest of fruits is increasing. Though I am not much of a prophet, I predict that in less than two years Minnesota will have a prohibition liquor law, and that double the amount of fruit will be consumed than there is at present. What a pleasing contrast this will be to the present condition of things. To-day the father toils for a dollar and at night goes to the saloon and spends it for liquor, which places him in a condition worse than that of the lowest brute, while his wife and children are clothed with rags and are suffering from hunger and cold. In the good coming part of his hard earned dollars will be spent for fruit, and in the other part of them for a nice lot of vegetables, his family will be well clothed and fed and his evenings spent at home and all will be happy.

This beautiful valley and the surrounding country is the natural home of several kinds of delicious fruits. Strawberries, raspberries, grapes and plums are found growing wild, and we see no reason why we should not grow strawberries and raspberries of largest size and finest quality equal to those of Minnetonka, which took the highest premium at the American Pomological Society, Philadelphia, and later at the World's Fair at New Orleans, cannot be grown in abundance.

Well, there, the good wife says, it is the indifference of the men and the ladies, that causes such a scarcity of these luxuries. The women could have their way every garden and farm would have a good sized berry patch. My experience has shown me that the good wife is right. Not only your wives but your children crave the greatest of nature's blessings. I have had the old widow, bent down with age and crippled with rheumatism so that she could scarcely walk, come many miles to see the big berries and ask for the privilege of picking a few, they looked so nice. And then when we have taken them to town to see the youngsters flock around them and look with longing eyes at the scarlet fruit.

I feel to-night like appealing to every man in our county who owns any land to set apart some of it for a berry patch, buy a few plants of the best kinds and then care for them.

Perhaps you may say you do not know what to buy, or how to care for them. To this I will say that it is the mission of our society

et and disseminate this kind of knowledge, and that if you will
it and pay the nominal sum of fifty cents we will furnish you
s giving instructions, showing how and what to plant and how
are for the same when planted. They give the experience of such
as Mr. Smith, of Wisconsin, who grew two hundred and seventy-
bushels of strawberries per acre last year, of Mr. Latham who
eighteen tons of grapes, of Mr. Lyon and Mr. Pearce with their
of raspberries and strawberries, and of many other famous hor-
ticulturists.

It methinks I hear some hard-fisted old farmer, whose chief diet
been pork and beans, tobacco and hoe cake or corn dodgers, say
this berry growing is too small business for him to attend to. To
I would say that your appetite and taste is so blunted and demor-
d that it might be dangerous for you to change your mode of liv-
and occupation to that of a horticulturalist.

we roll back the curtain of time 6,000 years or more we behold
first parents in the garden of Eden and their occupation that of
g for their vines and trees thereof. They were the first horticul-
turalists. I know it has been the custom for the sons of our farmers
to back on the occupation of their fathers and become doctors,
lawyers, etc. But I believe the tide is turning, and we predict that the
time is soon coming when the high places now filled with lawyers
millionaires will be filled with farmers and mechanics, whose
qualifications will not be measured by the size of their bank account.
The one who is following the occupation of old Adam will be
most honored in the land.

That the mission of the horticultural society is not only to encour-
the growing of fine fruits, but to encourage the raising of veget-
ables for home and market, the planting of trees both for useful and
ornamental purposes, the cultivation of flowers and ornamental shrubs,
the proper management of lawns, so as to make of our homes
pleasant places in which to dwell. Surely, these are subjects worthy
of the attention and support of every intelligent citizen.

That I am sorry to say that such is not the case. Horticultural en-
thusiasm is done by a few sacrificing individuals. Our State meeting
was held in St. Paul last winter, with perhaps a hundred members
present. A prize fight was held in Minneapolis at the same time and
about 8,000 men (but no ladies) gave one dollar each to see the
display.

At our fairs five or ten dollars is offered for the best display of
fruits or vegetables (a bid often not paid), while some professional

horse jockey or trickster takes away two or three hundred dollars of hard cash. I can hardly believe that this condition of things is a fair indication of the taste and wishes of a majority of our citizens, and I hope we shall soon see a change for the better.

To the people of Hutchinson I wish to say, encourage the growing of fruits and vegetables in every possible way until your home wants are supplied and until a large cannery will be required to consume the surplus, and then there will be healthy and profitable employment for every man, woman and child in your village. Mankato has had a cannery for several years and you have had just as good facilities as that town.

To our farmers I wish to say, do not let our villiage friends enjoy all the good things of this world. Do a little more thinking and a little less muscle work. You are buyers and sellers, why not be business men in every sense of the word.

Following is the report of the local society in Big Stone County:

LAKESIDE HORTICULTURAL SOCIETY.

To the Secretary of the State Horticultural Society:

No specially marked progress in fruit raising in this part of the State can be reported; though our people keep trying with persistent perseverance. The great drawback is a general deficiency of forest trees to protect such plants. A goodly number of our farmers are appreciating this necessity.

The tree peddler's enactment has operated favorably here—keeping out a set of cormorants.

The members of our society are considerably scattered, rendering it quite difficult to keep up regular meetings; but it is a live working institution. Under its direct auspices a very successful Farmers' Institute was held here last November, during which sessions the claims of forestry were urged upon the people, whereby to lay the foundation of successful fruit raising.

S. Y. GORDON, JR.

Secretary Lakeside Horticultural Society.

BROWNS VALLEY, Jan. 17, 1888.

Following is the report of the secretary of the Hennepin County Horticultural Society and Market Gardeners Association:

WISCONSIN COUNTY HORTICULTURAL SOCIETY AND MARKET GARDENERS ASSOCIATION.

O. Hillman, Secretary, etc.

We have about twenty active members who take some interest, although our books show a membership of fifty or more. We expect some blood will be injected into the organization and give it more life; I hope so, at least.

At the annual meeting in December the following officers were elected:

President—M. Pearce.

Vice-President—G. H. Roberts.

Secretary and Treasurer—Prof. L. Asire.

Executive Committee—Wyman Elliot, J. S. Gray, Wm. Lyons.

Yours truly, L. ASIRE,

Secretary.

DISCUSSION.

W. L. Stevens. I want to inquire of Mr. Sias as to his success in growing the Jessie strawberry.

W. Sias. We have only a few plants but they made a vigorous growth. A gentleman in the adjoining county to the west of us [Dodge] has tried it and is very successful; he has been growing it for the past five years.

W. L. Stevens. If the extravagant stories told with regard to this variety are true it seems to me its merits ought to be investigated.

W. Sias. The Jessie is said to be a seedling of the Sharpless; it is considerably larger.

W. Harris. I have quite a number of the plants that were set last year and it proves to be a vigorous grower. That is the most I can say for it, so far as my experience with it is concerned as yet. I was present at the summer meeting of the Wisconsin Horticultural Society at Baraboo, and it received much praise from many of the horticulturalists of that state, the almost universal opinion being that it was a good thing and the best that they have. But this is not universal, however; there are instances where it has proved a grand failure, the same as has been the case with other new varieties that have been sent out.

W. Pearce. What was the opinion of Mr. Smith, the president of the society?

Mr. Harris. He says with him it has been about as great a failure any variety he ever undertook to grow. I think there were some others who pronounced upon it in the same way.

Mr. Pearce. What is Mr. Smith's location?

Mr. Harris. He has a peculiar soil, with a sort of clay sub-soil, that seems to be just moist enough for a dry season. He succeeds with strawberries better than any other man I know; in fact, I think he stands ahead of all other western men as a strawberry grower. He does not succeed well with the Jessie, on his soil. Mathew Crawford, of Ohio, speaks highly of the variety, and sees no reason why it will not maintain the reputation it has thus far attained. I do not think we ought to recommend it for setting largely nor any more than for trial, until we know more about it; that is my candid opinion.

Mr. Dartt. You think we should not take the word of those interested in their sale, as regards their value?

Mr. Harris. Some times they see things through different kinds of glasses.

Mr. Sias. I will take mine off. I find the Jessie strawberry leaves withstood the effects of the drouth splendidly, and the plants have made a fine growth. The leaves seem to be of the right color and are very thrifty; that is one reason I have great confidence in the Jessie—its capacity for withstanding drouth.

Mr. C. L. Smith. When I heard of the Jessie strawberry and the great recommendations it received from the Wisconsin Horticultural Society, I concluded to plant some of them. I got two hundred plants; they grew nicely, made as fine a growth, I think, as any other strawberry plant I ever saw. But I am not surprised that they failed with Mr. Smith, of Wisconsin. He has not succeeded with any of the rank growers and never can with his soil. He has a deep, loose, sandy soil, with an abundance of moisture, which he manures very highly; and he succeeds well with the Wilson strawberry. I am satisfied from the crops I have seen raised of the Jessie, that when planted on that kind of soil it will prove a strong grower but that it will yield little fruit. I think that is his experience. Mr. Loudon, who originated the variety, has a soil that is not as strong, that is underlaid with clay; it succeeds well there. I would not advise any man to buy strawberry plants that are scarce enough to compel one to pay the prices that are charged for this variety. I don't think any of us Minnesota growers know enough about it to recommend it. As far as my experience goes I would consider it a fair variety to try for a few years; next year we may know more about it. I presume there are hundreds of growers

State who will fruit it this year. We must consider the condition under which it is grown. There are very few who have such that of Mr. J. M. Smith.

Harris. Mr. President, perhaps I ought to state my position regarding to the organization of the Southern Minnesota Horticultural Society. I have traveled around some in the State and find there increasing interest manifested to know more of the subject of culture. I have asked men to join our Society and they have said they did not join because they were unable to attend our meetings. They do not realize that they could get five times the cost of becoming a member from reading our reports, and still remain at home. They do not realize the benefit of having a large membership in all sections of the State. After thinking the matter over, knowing that Olmsted was the birthplace of the State Society, I did not see any good why it might not be a proper thing to have an organization for the northern or southeastern portion of the State. In my letter to the president of the society, I urged them to maintain their county organization and tried to tell them how they could help to build up this society. I told them that we ought to have five thousand members. We might be able to get that number of names enrolled if we had more organizations in the State that would work to this end. I hope that their new organization may prove to be a success. I further stated in my letter to Mr. Sias that I thought the State Society ought to have a Board of Horticulture; I believe the same now. We ought to have horticultural experiment stations all over the State, and that these stations should be under the charge of disinterested county societies. Some might argue that this plan would be in the State Society. Gentlemen, horticulture is like a great many other things, it is "catching." If some of our country friends come out to the meetings of the Southern Minnesota Horticultural Society, they will become interested, and they will certainly want to attend the meetings of the State Society. I hope in the near future we will be able to hit upon some feasible plan for all the local organizations to claim a membership in this Society.

CORRESPONDENCE.

The following letter was read from President Lyon of the Michigan State Horticultural Society:

FROM MICHIGAN.

SOUTH HAVEN, MICH., Dec. 28, 1887

S. D. Hillman, Secretary Minnesota Horticultural Society:

MY DEAR SIR: I am just in receipt of the program of your annual meeting to occur on Jan. 17-20, prox.

During my hasty visit to your city and State in August last, I was very much surprised in the way of horticultural advancement and I would gladly have extended the calls I was able to make upon yourself, President Elliot and the various objects of interest about your wonderful and thriving city. I was also very much interested in looking over the various horticultural plantations which I was able to visit; among which were the State farm near your city, the plantation of Mr. Gideon, at Excelsior; that of Mr. Luedloff, near Carver; Mr. Sias, of Rochester, and Mr. Harris, of La Crescent.

I also observed with not a little surprise the wonderful energy and courage displayed by your fruit growers in the face of the climatic calamities by which your State has been visited.

If we, in Michigan, had more of the enthusiasm which you people manifest in the face of your peculiar afflictions, we might hope to accomplish far more that has yet fallen to our lot.

The little which I have been able to see of the men and the horticulture of your State adds greatly to my interest in your doings as well as to my desire to know you and your people more intimately.

Very truly yours, T. T. LYON

FROM CHAS. W. GARFIELD.

SECRETARY'S OFFICE, GRAND RAPIDS, MICH.

Dec. 21, 1887

Dear Secretary Hillman:

Your favor received, and I hasten to say that it will be impossible

to make any further engagements than those in Wisconsin. I
 like so very much to meet you and your Society, but time and
 strength are limited; and I, in a moment of rashness, agreed to spend
 days in Wisconsin, following January 10th.

Sincerely yours, GARFIELD.

FROM WISCONSIN.

JANESVILLE, WIS., Jan. 14, 1888.

Address of Minnesota Horticultural Society:

should have been glad to have met with you this winter. Our
 committee appointed our corresponding secretary, A. S. Hatch, dele-
 gate who will extend to you our society's greeting for this "open
 season."

hoping your horticultural work will keep step to the music of 40°
 below zero, and yet prove the varieties that will pay you abundantly.

I remain truly yours,

GEO. J. KELLOGG.

S. Enclosed find my youngest daughter's first horticultural
 essay—competing for one of your prizes.

G. J. K.

FROM NEW YORK.

ROCHESTER, N. Y., Dec. 30, 1887.

Wm. Hillman, Secretary, etc.:

The announcement of the meeting of the Minnesota State Horticul-
 tural Society, Jan. 17, 18, 19 and 20, with program, is at hand.

It will be a pleasure if you will forward such accounts of the meet-
 ings as may be published at the time in the daily Minneapolis papers,
 and any additional notes you may think best. From these I can make
 an account for publication. It is always interesting to hear from
 the wide awake Society.

Yours very respectfully,

C. W. SELLYE,

Editor Vick's Magazine.

FROM TEXAS.

DALLAS, TEXAS, Dec. 30, 1887.

S. D. Hillman, Secretary, etc.:

DEAR SIR: Your kind invitation and letter received.

Thanks for the former, and in reply to the latter, beg to say our State report is not out yet. When out will comply with your request. I am doing all I can to get same out. Will you send a delegation to California to the national convention of the American Horticultural Society? We send you programs of our last state and local meetings.

Yours truly, MRS. J. R. JOHNSON,
Secretary Texas State Horticultural Society.

FROM WASHINGTON.

U. S. DEPARTMENT OF AGRICULTURE, }
 WASHINGTON, D. C., Nov. 29, 1887. }

S. D. Hillman, Secretary, etc.:

DEAR SIR: This year I again submit for your consideration another schedule, which is but slightly changed from that of last year. You will see that according to it, it is desirable that your Society hold its annual meetings on the first Tuesday after the fourth Monday in January of each year. The only reason for this, is the fact of the collision in the meetings of your State and Iowa, unless some such arrangement is made permanently. There are special reasons, as we all well know, why this should not occur—because of the intimate relations of their respective members, and because of climatic conditions of similar character. Please present this matter at your next annual meeting.

Yours fraternally,

H. E. VAN DEMAN.

I recommend the adoption of the following:

SCHEDULE FOR ANNUAL MEETINGS OF STATE HORTICULTURAL SOCIETIES.

First Wednesday in December (annual meetings), Michigan, Dakota, Missouri; second Wednesday in December, Ohio; second Tuesday in December, Illinois; third Tuesday in December, Kansas and Kentucky; first Tuesday after first Monday in January, Indiana and Colorado; first Tuesday after second Monday in January, Nebraska; first Tuesday after third Monday in January, Iowa and Pennsylvania;

Tuesday after fourth Monday in January, Minnesota and West-
 New York; first Tuesday after first Monday in February, Wiscon-
 first Tuesday after second Monday in February, Michigan.

following from Com. Van Deman was also read:

GENEVA, KAS., Dec. 23, 1887.

Hillman, Secretary, etc.:

DEAR SIR; Your letter of December 5th, has followed me here,
 I am spending a few days with my family after a visit to some
 western states on official matters.

I will write to the secretary of the Iowa Horticultural Society ask-
 they can take the date proposed for your State. But they have
 held that position that it may be hard to get them to do so.
 In the meantime will you not endeavor to have your Society leave the
 in such shape that you can change if Iowa does not?

I would gladly send you something to present at your next meeting
 were possible, but owing to extreme pressure on my time, getting
 special reports or bulletins in addition to other regular work, that
 be almost out of the question. However, I will *try*, but hardly
 to reach it in time for your meeting. I will soon return to
 Newton where you can always address me.

Some of the bulletins I mention will be of interest to you in the
 west, and will be sent to all your members without further
 charge, as I have their names upon my list.

Yours, fraternally, H. E. VAN DEMAN,
Pomologist to U. S. Department of Agriculture.

FROM R. L. COTTERELL.

DOVER, OLMSTED Co., Dec 29, 1887.

Hillman, Secretary, etc.:

Thank you for this notice. I should feel a great pleasure in attend-
 ing your meetings, as I feel as much interest as usual, but remember I
 am getting old, and it is rather severe weather, or I would like to meet
 my familiar friends.

I should be very much obliged should you furnish me with any of
 the proceedings of the Society; it will be esteemed a great favor by

Yours very truly,

R. L. COTTERELL.

President Elliot here stated that Mr. Cotterell was an honorary

member of the Society and one of the original twelve who assisted in its organization.

FROM PROF. OESTLUND, OF THE STATE UNIVERSITY.

MINNEAPOLIS, MINN., Jan. 3, 1888.

S. D. Hillman, Secretary, etc. :

DEAR SIR: Yours of December 28th, at hand. I will be pleased to make use of the time you have given me to address the Horticultural Society on the subject of Entomology. I will not have any special reports this year that will require cuts.

In my last report I asked members of the Society to send me specimens of any insect that was found to be injurious or on which any information would be wanted, and I would then look up the subject and report at the annual meeting. But during the year I have not heard a word from any of the members, and have not had time to undertake any special work on insects injurious to the horticulturist.

The subject of entomology is not recognized as it ought to be in our State, and we all need to be a little wakened up if we could get the right man to present the subject before us. I am glad to do what I can, but this is not much.

During the summer I have used most of my time in collecting our insects along the western border of the State and in finishing my report on the plant lice of Minnesota; a copy of which I take pleasure to mail you.

Yours truly,

O. W. OESTLUND.

FROM DAKOTA.

RAMSEY, McCOOK Co., DAKOTA, July 2, 1887.

S. D. Hillman, Secretary, etc. :

MY DEAR SIR: The Report for 1887 has come to hand, and the reading of it has been the comfort of many a leisure hour. I think of the old Society every time I go into my garden. There I am reminded of its influence, and for what little I have there that is better than the average farmer's garden contains, and for all the benefit and pleasure I derive from the garden in any respect, I feel an obligation to the Society for giving me the horticultural bent of mind and holding me to it till it became second nature.

y to Mr. Harris, when you meet him, that I appreciate and thank for the motion to make me an honorary life member.

you asked me once to furnish my photograph for the picture gallery. I have no spare copy suitable, and it is uncertain when, if ever, I may get out where a new one could be taken. Meantime, I wish you would go into the State Fair buildings for a large photograph I left there in September, 1885, in frame, showing a group of the State and Territorial commissioners at the World's Exposition in New Orleans. If it is still there, ask Secretary Hoard to let you have it. In the group my friends will recognize what was left of me after my Washington mission. It is the best I can do for you at present. Let me know if you can find it. I left it hanging on a panel of the fish exhibit. It was given me as a present to Gov. Hubbard, and I asked him to send for it, but the fair of that year was over, but I presume he never thought of it afterwards.

Why is Andrew Peterson left out of the list of life members? He was elected on my motion at the same time with Charles Lued-

It is one of my pleasant memories that I discovered these grand old men out there in Carver county and brought them and their works before the Society, and enlisted them for life as members. It strengthens my courage in apple growing to know that Mr. Peterson's surviving Russian trees—strays from the East plain, sifted out of the Washington importation, as Mr. Budd called them—have continued ever since, the same as they look as when they greeted my prophetic soul in August, 1885, when I found them, searching as I was, not alone for apples to win the medal with at Philadelphia, but for things new and improving, to bring before the Horticultural Society. It was the first time I had ever seen a test of the Russian trees—all else had been top-worked on crabs; but the first time, also, that I had seen an apple tree in Minnesota that said plainly in every expression of leaf and wood that it had come to stay. These trees must now be from twelve to fourteen years old—no test for a single seedling, having its own top root under it, but for a group of root grafted trees, a pretty good one. If, as Prof. H. J. Avers, others of the East plain Russians, having equal adaptation to our Northwestern climate, are in addition good in quality for growing out of hand, we are nearer success in orcharding than by the grafting route; though to one traveling either from the Russian starting point or any other starting point, "happy may be his dole," I say. As to my own Russian trees—apple, pear, cherry and plum—planted in 1885, about one hundred and twenty-five in number as before re-

ported, the most of them wintered well. They made a good deal showing when new growth commenced this spring than my Dutch and Wealthy, most of which I had to cut back; more, I think, count of insufficient growth in our dry season of '86, than from other fault. I have added about fifty more Russians to my orchard all from Prof. Budd and, in the fall, will try to give you a statement of their appearance then. They are all making a thrifty growth this year.

We have had a poor season here to test new varieties of strawberries—too dry till picking season was over. None of mine have proved satisfactory. Their growth for next year is now well started by the rains, and I will give them another trial before reporting on the results.

A garden item: Early last fall I emptied my whole barn yard of the garden, covering the ground out of sight and pretty deep. In the spring as soon as dry enough, I burned the manure all off—at least the strawy, fibrous part, before ploughing. Have scarcely seen a wire worm. Things are growing like Jack's bean, and the vegetables are of a tender, succulent quality, quite unusual. Peas and potatoes planted April 15th—the William Hurst pea was ready for the market June 10th; the Champion of England, June 30th, and Early Wonder potatoes, June 22d.

Wild fruits abundant with us this season, especially gooseberries, grapes, plums and choke cherries.

With best wishes for your continued prosperity,

I am, yours truly, OLIVER GIBBS,

SUPPLEMENTARY.

Dec. 3, 1886

Continuing the garden report and completing the season, I find that the four varieties of watermelons planted—Excelsior, Iron Mountain Sweet and Stokes—the latter, although very sweet and reported last year, inclining to toughness, and shall reject it. Iron Clad I would only plant for variety to exhibit at fairs. It produces the largest specimens, and is very showy, but its quality is inferior. The Mountain Sweet is always good and averages well. But I would always plant the Excelsior, and if but one sort, it would be this. It is the earliest of the lot with me; yields abundantly small ones and many that weigh thirty to forty pounds, and of delicious quality and always tender. Rind thin, flesh of a deep pink. I showed ten of the Excelsior at our county fair, September

ing three hundred and fifty pounds. Largest Iron Clad in that
tion weighed thirty-seven pounds; but one stolen from same
that would have gone to fifty pounds. A new variety appeared
g my vines which had the shape of the Mountain Sweet, color a
are between that of the Excelsior and Stokes; size, a medium,
een Mountain Sweet and Stokes, and quality, texture and color
sh a combination of all three at their very best, with smallish
like the Stokes, but larger. If I can fix the type by replanting
l be a lovely melon for home use.

planted the same muskmelons as reported on last year—Miller's
n Nutmeg and Bird Cantaloupe. The Miller is perfection for
use, but cracks at the stem as soon as fit to use, and will not
er for market. The Bird cantaloupe shows this year a cross with
Miller, bringing up its quality to a high grade, retaining its firm-
and soundness for handling, and losing about one-third in size.
type I hope to fix by replanting.

e market for melons was always ready at Madison at about a cent
and by the wagon load for well-grown lots. I sent in several
all I could get in without neglecting the farm harvest; but the
pay I got for the labor in raising my melons was by calling in
ighbors for six miles around one pleasant day in September and
g a melon pic-nic. Half a ton of melons disappeared in the
noon, and just before sundown our guests opened their lunch
ts and spread an excellent pic-nic suppe. for us on tables laid on
blue grass lawn in front of the house. I reckon some missionary
was done in the melon cause by the distribution of the pic-nic
; and I presume some of my guests will beat me out of my pre-
as at the county fair next year.

tomatoes this year I had the Beauty in addition to Livingston's
sorts, the Perfection and the Favorite—all first class every way,
he Beauty averaged larger than the others, and I prefer its color
t of the Acme. The whole crop was late in ripening, and after
eting about twenty bushels of ripe tomatoes, I tried the experi-
of using the green ones for cow feed. I found the cows would
hem with good relish, taking half a bushel at a ration; and offer-
hem to my horses, they, too, pronounced them good and whole-
I fed them for a month from the garden, the frost holding off
he latter part of October, and then putting about fifty bushels in
basement of my barn, used them up before decay set in. To
er them cheaply I pulled up the vines by the roots, let them wilt
days, and then shook the tomatoes off and picked them up as we
d potatoes.

Recurring to small fruits, I expect to be able to make a good report next year on strawberries, as my Crescents, which I neglected to mention in last report, and my Glendales, Sharpless, Warrens, Parry's, Black Defiance and Triumphe De Glondes have all made a luxuriant growth, and the Jewell a few strong plants.

In the orchard, everthing that got a fair start in last year's dry season, has done well this summer, and the rest that were cut back last spring have made good new stems, the ground froze up dry about a week ago, but not deep, till we got two snow falls, each of about four inches, in quick succession—the last very damp, so as to prevent drifting, and both will probably melt and go into the ground before we have any hard freezes. The additional Russians sent me by Prof. Budd last spring, apple, pear, cherry and plum, together with some trees of the Wolf native plum of Iowa, said to be a freestone similar to the Weaver, but darker in color, and larger, have all made a vigorous growth.

Speaking of native plums, I have a lot of letters of inquiry and asking for seeds and cions, as a result of my report on my plum grower at your last annual meeting. It is annoying, for only now and then a correspondent sends stamps for a reply, and I am too busy with my own affairs to attend to their requests, and not being in the trade have no facilities to pack for mail or shipment. If your experimental stations want to try them, I shall be happy to furnish small lots to each, if your Society will let me refer to them and will undertake redistribution when enough cions are grown. The crop this year was very abundant on nearly all the trees outside of the cattle pasture, and the surplus sold at sight by the load at Madison at two dollars per bushel. As a hint to others, I will mention here, that the market at the same time was overstocked with half ripened, poorly handled plums from the Big Sioux and the gulches in this vicinity at one dollar per bushel; but mine were left on the trees till ripe and in full color, handled carefully, crated in Beecher baskets—a lot that I have had on hand for fifteen years in continuous use—and carried to town in a spring wagon. We shook them off upon a soft carpet of grass without injury, as the space under the trees was kept mown like a lawn and all rough or sharp things kept grubbed out or picked up for this purpose. I would never cultivate the native plum, but keep the ground in grass and fertilize by top dressing when necessary. This to prevent suckers from severed roots. No new sorts worthy of mention found this season, although previous favorable impressions are sustained and increased by second testing of many sorts. We find

al sorts that have so little acidity as to make a very palatable butter with but a moderate amount of sugar, and these are all freestones; but the best plum yet tested for canning is the wild Damson spoken of in last report. I found this year scores of young trees of this variety scattered all about my woods, in bearing, identical in every way with the parent tree, showing that it reproduces itself exactly from seed, although surrounded everywhere with many of other sorts. The best plum to eat out of hand is a small, dark-red freestone, bearing enormously and medium late, and holds on well against the wind. This is a cross from older trees standing near—one sort a big, dark red, perfectly sweet and solid-meated plum, and the other a large, light red cling, of good sub acid quality. This tree has borne heavily for two years in succession. The best plum for all purposes is the one I mentioned last winter for its remarkable beauty of color and finish. I speak of this now in order to mention a singular fact. It is the only plum on my grounds that is seriously interfered with by the birds, although my woods are full of the birds of the North. They puncture every plum of this variety as soon as it is ripe. Is it because of its striking beauty? Certainly there are other plums in the vicinity at the same season of bearing good enough in quality. Next year I must cover at least one tree of this sort or lay and watch to discover what bird does the mischief. I shall not pass sentence of death in advance, like Jephthah, for it may be some favorite songster. I suspect the turtle-dove, and might find it the sly brown thrush, a bird I love and for which I would plant a plum orchard if he could not live with me without, in memory of one little pet of this species that summered and wintered with me at Lake City with the freedom of the premises, coming to the window to be fed and to his perch in the house at any downfall—bathing in the snow winters, and in the chicken drinking-pond in summers—boss of the poultry yard, keeping the fowls off the back porch, and companion of my garden work in quest of all worms and beetles—victim at last to the marauding cat of a neighbor.

I am too prolix, cut me down; but I am reminded here of many other things of interest to me—possibly to others. My best bird fruit is the choke cherry. They take every one—bushels and bushels in some places, but what a scattering they make of the pits, and what myriads of young trees coming up everywhere outside the cultivated fields. I am obliged to make war on the choke cherry trees in some of my gulches to keep down the black knot and prevent its spreading to the plum trees; but for all that, it is a lovely tree, either in blossom or fruit,

and a good companion for the wild tree rose which seems to seek out this tree, pushing its stalks up among the cherry branches on the shady banks, and hanging out its bright red blooms resting on the cherry leaves, six to eight feet from the ground, in pleasing contrast to the dark green of the cherry and offering the illusion of rose blooms growing from the cherry.

The next best bird fruit is the wild gooseberry, which is as abundant here as the hazel in Minnesota, and yielding in great abundance a large smooth fruit, in good demand in the market either green or ripe. A drove of a hundred turkeys subsisted almost entirely upon them while green, and when ripe the little wild birds leisurely harvested what there was left. None of my birds interfered with the garden strawberries last summer.

I think Mr. Brand was too severe on the sand cherry in his remarks last winter. I have seen it in full bearing this year. It occupies no more space than a currant bush, and bears an enormous crop of black, glossy cherries about the size of the Janesville grapes. It is not a fruit to eat out of hand, having a little of the acid flavor of the choke cherry, but this disappears in cooking; and it is so hardy and so prolific, and so handsome, and so useful for pies, cherry butter, canned fruit and jelly, as reported by my neighbors who grow it, that I would certainly recommend it for trial. If "so disposed," as Mrs. Gamp would say, I would undertake to educate the fruit market of any town near me to take the sand cherries in large quantities.

I have not yet seen a Dakota-grown apple in this county, and only a few crabs; and none of the nurserymen's native plums, except a single plate of De Sotas shown at our county fair. But I hear that in Turner and Clay, the two next counties south, there were a good many fine apples raised. I did not attend the Territorial fair at Mitchell, being laid up at home with sundry ills the flesh is heir to. But I am going up to Huron the thirteenth to meet with the Horticultural Society, and may then inflict on you another supplement.

A word about the roses and other flowers and I am done. We brought with us from Lake City and planted out in the spring of '86, of the roses, our favorite damask--name unknown--the Plantier, the white Scotch, the yellow Harrison, the old-fashioned Blush; the Boursault climber and three kinds of moss roses, whose names are not known. All these gave us handsome blooms last summer--the Boursault having two hundred and eighty-five from one root. How is this for only one year's growth after transplanting; and so much better is our soil than where we used to grow the roses, that there is a marked

of size and brilliancy of the blooms. We planted last spring the set of Salzers "Diamond Four," the Jacquiminot, the France, the Coquette des Alps and the Capt. Christy—the latter the favorite rose of Mr. Bancroft, the historian, out of five hundred that his gardener at Washington once told me. All have made a good growth, and the La France and the Coquette put out a few nice blooms in the latter part of the summer. We lay down and cover all the roses with sod spaded from the grass near by; and shall uncover the Diamond Four in the spring with some anxiety for their life; but I hope they will stand out doors. I cannot report in detail on the annual flowers except that there was an abundance of the common favorites and some of the new sorts, and that they looked pretty well nice, and were in much request among our guests and picnics, and somehow one carries nothing more agreeable to a city than a nice bouquet. Their names, at least the common sorts, are not known only to the superintendent of that department who uses my envelope too freely to save the seeds and write the back-up names on, and crams the drawers and pigeon holes of the desk with the packages. But I get acquainted with the perennials. The one year's growth that rewarded us with rose blooms on the plants we brought from the old garden, also brought out the flowers of the lilacs, the grandiflora, the spireas, the nigalias, the clematis, the nisterias and the peonias, and here also reminding us of the richness of our soil. The buffalo berry, *Argentea Sheperdu*, I have growing in my pasture and transplanted half a dozen small ones to the garden last year. It is a dainty little ornamental tree, in all respects—form of tree, leaves, blossoms and fruits. It holds its color undimmed by frost till the last hard freeze-up just as winter

this report is too lengthy. Slash it till it fits into the program of the time allotted to other things.

I should be glad to attend your annual meeting; but although I am only myself a little in horticulture, the farm business is my employment even in winter, and obliges me to keep closely at home, at least so far away. Have not set foot in a railroad car since November 15, when we came here. But don't weep for me on that account. It will come to be a relief not to be obliged to ride on them or go anywhere away from home, for that matter--and is so still. G.

Next on the program was a paper by Mr. Dartt.

Mr. Dartt. Mr. President, I was invited to prepare a paper on experimental stations, their scope and usefulness, as I understood it. I think those were the words of the Secretary; and I wrote accordingly that I would try and do so, but when I came to get the proposition I found it was a different thing. I found he had made the task a great deal harder there than at the first. As you all know, it is a great deal easier matter for one to talk at random about a thing, but when you are pinned right down to the thing itself, it is a great deal more difficult. I am trying to run an experimental station at Owatonna and I am asking this Society for instruction. It would be presumption on my part to expect to be able, or to undertake to educate the Society; it would be entirely wrong. So I have written according to the first proposition which gives me a chance to talk at random. I do this knowing that fools can ask questions that wise men are puzzled to answer. I know, too, that the principle comes in that it is easy to prate about the Bunker Hill monument but not easy to build one. I would rather prate at experimental stations than come down here and try to instruct you how to run a horticultural experiment. With this explanation I will read my random remarks:

EXPERIMENT STATIONS: THEIR SCOPE AND USEFULNESS

By E. H. S. Dartt, Owatonna.

Mr. President, Ladies and Gentlemen:

In considering this subject, our main object should be to determine in what way, we can secure the greatest permanent benefits, in the shortest time and at the least expense. And the first question to be asked is in what line of experiment may we reasonably expect to secure these permanent public benefits? Not in the line of small experiments for our experimenter would hardly have time to explode one before another would be on and he would have to settle down to the business of chasing humbugs which would be comparatively easy on account of their rapid flight and transitory nature. In regard to flowers and vegetables they seem to be on a paying basis, and we can get a few baits from the public crib. In farm products we favor experiments, but to do most good they should be so simplified that the average farmer can comprehend and comply with the conditions.

It is quite important to know what breeds of farm stock are best but the difference is not so great as our fancy stock breeders would have us believe, or as to require extensive experiment. We know the "swill pail hog" and the "meal and bran cows" are ex-

eds, and the best seed corn we ever tried was the Richfield. We
w about one hundred and sixty bushels of ears of dent corn to the
s.

or our greatest benefits from experiment we must look in those
s where it can change partial or total failure to success. If cer-
breeds of cattle were exempt from cattle diseases, and certain
ds of hogs were exempt from hog cholera, then the question of
ds would become of vast importance, but such does not seem to
he case. Then where shall we look for such conditions. This
ats directly to our glorious hobby, fruit, forest and ornamental
s. Here in our different varieties and climatic influences we have
he gradations from total failure to eminent success, and I firmly
eve that no line of experiment can be followed with such assurance
eneficial results to the present and future generations. For, what
ld the world be without trees? And what must the condition of
part of it soon become unless tree planting shall receive a greater
etus? Now, whilst we seem to have found tricks in all trades but
, some of the other fellows say our hobby is the biggest humbug
and that experimenting at public expense is useless for the reason
it absorbs vast sums of money without adequate returns. Their
r seems to arise from the fact that the money goes out in round
s, so many thousands of dollars which anybody can comprehend,
st the beneficial results are so scattered and far-reaching that it
ires a penetrating mind to see and comprehend their vast im-
ance. And even then, great benefits may result without becom-
perceptible at all.

ppose the wheat experiments at our central station should
le our farmers to increase their yield only one per cent or four
ts to the acre. If they realized this, they might say it is a small
er and it don't pay to run these high-toned institutions. Still
e benefits might be continuous and cumulative, and if figured for
year would amount to over \$200,000, enough to establish and run
experiment station for many years. Again, suppose a man, by
roved methods should increase the profits of his farm ten or
ty per cent he would not know where to place the credit. Evi-
ly most of it would be due to his own good sense and energy, but
out agricultural papers, farmers' institutes and experiment sta-
s, he would still be plodding on in his old ways.

any farmers believe that the interest taken in their welfare is
upted by purely selfish motives—that they are favored like fatten-
animals that they may afford better pickings for those who prey

upon the industries of the world. And that our country is largely controlled by rings and combinations whose policy it is to tax every industry just as much as its degree of prosperity will warrant, and that if their prosperity as a class should be increased it would be followed by increased exactions.

In this view of the case it does not seem strange that they do not take kindly to the teachings of men brought in from the trades or professions to teach them how to manage the farm.

Experiments, to satisfy this class, must be managed in each leading department by a man of practical experience and in whom the people have confidence, and they must be on a scale of sufficient magnitude and surrounded by such circumstances as will make them fair and practicable tests. Too much science is not admissible in the common walks of life.

If these conditions are not secured as approximated, it will not be strange if some of our farmers should shout humbug! and if some of the more modest professors should think about the pearls and the swine.

There is probably no branch of business where the old theory of every man to his trade comes in with more force than in conducting experiments of whatever nature. An obscure poet has said:

“Take the wisest man that ever drew the pen,
Or raised his voice to be heard by men,
He'll tell of things taught in his school,
But if y^e go beyond, he too's a fool.”

Now, sir, we think we discover a great deal of the far beyond in conducting varied experiments, for if precedents are found they can seldom be applied on account of a change of surroundings. The word experiment implies the exploration of new fields, and these fields when entered will be found so expansive as to afford ample room for the best efforts of your best man, though he be philosopher and sage. If he jumps at conclusions, he will frequently stumble, and if he carefully feels his way, his progress will be so slow as to require from a reasonable public the exercise of those commendable virtues, patience and charity.

DISCUSSION.

Mr. Pearce. Mr. President, I am not in favor so much of what are called experiment stations as fruit and tree stations. There are stations where men will experiment as a business, and after their experiments have been made the results have been established beyond a

shadow of doubt. My view is this, that we as a Society should not put out anything at a station but what we have tested ourselves. We should be able to describe the variety of tree and to give the number that failed to grow. Each man in charge of a station should have a duty to perform and he should be governed by that duty. Our experiments ought to be such as would warrant success. Now, I take it that after I have experimented on certain things I ought to be able to say, do thus and so and you will get a crop. I am in favor of fruit and forestry stations where we can put our trees and say that we know they will grow. That is the general view I take of it. An experimenter is an expert and he has got to use his experience. His experience is used, it becomes developed and established with regard to any variety, and then anybody can grow it. When Columbus broke the egg and made it stand alone, anybody could do it.

Mr. Sias. I consider this paper of Mr. Dartt's a very valuable one and I would like to hear it fully discussed. I believe that there are several other papers to be read upon this subject and I suggest whether it would not be better to hear those and have them all discussed at one time; certainly there should be a full discussion on the matter of experiment stations.

Mr. Dartt. Mr. President, I agree with Mr. Sias in regard to the propriety of delaying discussion until the other reports are in.

Mr. Harris. The reports from experiment stations come in the last place. I am very much in favor of experiment stations. Experience is like a hard school, but it is one in which we can learn something. I believe we ought to have an experiment station in every county in the State of Minnesota, and that those stations in a certain measure ought to be under the control of the State Horticultural Society. In speaking of horticultural experiment stations we ought to have a man in charge of these stations who have the capacity to manage them. For instance, we might have one man to conduct experiments in one line, and another in another department. One man may succeed in growing seedling apples, another in small fruit; while here and there we may find a man who has the ability to conduct experiments successfully along the whole line.

The field for experiment in this State is a very broad one. It is well known that we have met with a series of reverses in our endeavors to grow the apple; to-day we dare not stand out and say to the world that we can grow the apple successfully here. But by testing Russian varieties and new seedlings, and planting the seeds of these Russian varieties and of the best seedlings and crossing them, we may hope in

time to secure varieties that will be adapted to our wants in every portion of our State. We want to conduct our experiments with a view to get apples that will last us the year round, as we must recognize that fruit has become an absolute necessity. It is necessary to have fruit upon our tables, and if there is a lack in this direction we are living very poorly. •

We have the native plum growing in our State and in Dakota, and as far north as the Red River of the North, and some varieties of the plum are very choice fruit. It seems to me that our experimenters ought to collect together the best varieties that can be found in these northern regions and raise seedlings from them to get the best and distribute the products so that every farmer throughout the State and in Dakota may know that they can grow the native plum in great abundance and varieties that are choice in quality. If we follow up the improvement of any one kind of fruit properly it can be so improved as to be fit for use in our kitchens and upon our tables.

One of the most important things for experimenting upon is forestry. We want to test the question whether our native trees that are growing in our forests in Minnesota, are better adapted for use than trees that are brought here from Europe; to find out the best methods of culture and planting; to determine which will furnish the cheapest and best fuel, and afford material for lumber and shelter-belts, in the very shortest space of time. These and other questions could be brought out by experiments at these stations. I hope this Society will encourage the work to be done at such stations and that we can have them located where such experiments may be carried on, and if they are properly conducted I will guarantee that they will not only be of service but that we shall receive much benefit from them.

President Elliot. I do not think we had better continue this discussion at this time, but take up some of the unfinished correspondence. We have a question box and anyone that desires can prepare a question to be brought before the meeting at the close of every session, when if there is time a few minutes can be given to discussion of whatever the subject may be

FROM COMMISSIONER COLMAN.

S. D. Hillman, Secretary, etc. :

DEAR SIR: This section is collecting material for a report on apple

, and it is desirable that information concerning the extent of the
ries occasioned by the disease be obtained from your State.

ou will greatly aid this section in this work by answering, as far
ou are able, the following questions:

What is a fair estimate of the annual loss occasioned by the
ase in your State?

What varieties are subject to the attacks of the disease?

l. What varieties are comparatively free from the attacks of the
?

. Does the character of the soil or atmospheric conditions in
way influence the spread of the disease?

Do you know of any remedies that have been used with success?

oping that you will favor the section with the desired information,

I remain, respectfully,

NORMAN J. COLMAN,
Commissioner.

DISCUSSION.

r. Brand. Mr. President, I will say that while I was in the
h I met the Rebel General French, and in conversation with him
ated that when he was a boy they were troubled with the scab in
State of Virginia; that in his father's orchard they tried the ex-
ment of boring a hole in the body of the apple tree, put in a quan-
of sulphur and then plugged up the hole; that for years
wards the tree was never troubled with scab.

r. Harris. If he had put the sulphur under the tree it would have
still more beneficial.

r. Dartt. I would like to know, Mr. President, if there has been
instance of apple scab known in this State?

r. Harris. I have seen it on one or two seedlings and observed it
y orchard the summer before last on my Strawberry crab.

r. Dartt. I think I have seen it on apples that were brought in
other states.

resident Elliot. For the information of some of the members it
t be well for you to explain what it is.

r. Dartt. I don't think I can.

r. Harris. It forms upon the fruit and takes a growth which
nds if it is very bad until the apple will get as much out of shape as
e that are effected by the curculio. It has a vigorous growth, but
ve not seen it in this State far enough developed to cause cracking

of the fruit, but enough to effect the shape of the apple. In conditions where the trees are very much confined for want of circulation of the air there is more of the disease manifest.

Mr. Brand. I would like to add a word to this talk in regard to experimental stations, and I would like to say now that it is the duty of this Society to instruct Commissioner Colman (if he does not know his duty,) that is just what he is there for, to try and explain different things that prove destructive to various crops and to find out remedies for the same.

Mr. Pearce. That is just what he is doing.

Mr. Brand. The benefit is for the whole people and the government should pay the expense of ascertaining these facts.

Mr. Dartt. Mr. President, I would say that I received a circular from Mr. Colman asking the number of fruit trees and the number of acres I had in cultivation, stating that the information was wanted with a view of putting himself in communication with the fruit growers of the country, for the purpose of getting information from them.

President Elliot here introduced Mr. J. S. B. Thompson, of Grundy Center, Iowa, as a delegate from the Iowa Horticultural Society.

On motion of Mr. Stevens Mr. Thompson was made an honorary member of the Society.

REMARKS OF MR. THOMPSON.

Mr. Thompson. Mr. President, and fellow horticulturists: I return to you my sincere thanks for the honor you have conferred upon me, in permitting me, as a representative of the State of Iowa, to mingle with you in your discussions at this meeting. I hope and trust that the knowledge we gain in this manner may be of mutual benefit.

There seems to be a little question in dispute here in regard to the blight of the apple. In Missouri it has effected the fruit very much; it is caused by the buffalo midge stinging the fruit. In this State and in Iowa, it is injured by the stinging ant; perhaps some of you have run into a covey of them; I don't know whether they bite or sting, but they hurt most awfully when they get after a person. I noticed a swarm of these ants in a young orchard and they almost ruined one-third of the fruit on one tree. I was working around there and made up my mind to have a row with them. I went to the house and got some torches and soon drove them out. I noticed that the fruit they stung would wither and the apple would grow out of shape. When first stung it expands in growth and afterwards there is a dark,

on speck, forming into a knot, as the fruit grows; when you
to remove it by peeling the apple you will have to cut a quarter
inch deep in taking it out.

Missouri they have the midge and the scale louse; the same
is noticed in California. The disease is described at length in
work which I have here. I hold in my hand a report from the De-
partment of Agriculture, by Mr. Colman and also by Mr. Van Deman.
contains the report of the agricultural department, that of the
chemist, the statician, entomologist, etc. It appears from the report
there have been at least one hundred and fifty different experiments
on the California fruits, and some are recorded here as to fruit
Missouri. They have tried experiments with soap and kerosene,
and whale oil, etc.

Mr. Harris. Carbolic acid is also used.

Mr. Thompson. I think it is, but there are more than one hundred
and fifty experiments mentioned. I received this book about three
years ago, and it is worth a twenty-dollar gold piece to any man who
growing fruit, I don't care who he is, if he will read it and practice
it. This information is gathered up from different localities and is
recorded here.

As regards to these experimental stations I think that every man
ought to make himself an independent experimenter. What will grow
on that brother's farm there might not grow on mine, or on this other
brother's. The soil has a great deal to do with the growth of trees as
well as climate, but both have their effect. I presume there is not a
chemist in the room that would read the chemist's report in this
book that would believe that the life propensities or the sources of
the growth of the different trees, derive their sustenance and nourishment
from the growth and life of the tree, from chemical action. If you
were to see the chemical analyzation of even the Ben Davis apple you
could hardly believe it; I didn't believe it myself. I read it over
and finally made up my mind that it was like the Bible, meant
what it believed and I would believe it.

I am trying experiments all the while. I find it helps me, and these
experiments have proved a benefit to several of my neighbors, also.
The experiments I have made in a seedling orchard have been worth
hundreds of dollars in our State. The experiments you have been
conducting in this State have also been of great value.

This report here states that already the Wealthy apple, which was
introduced by Mr. Gideon, of this county, is becoming a leading apple
for export, from Canada and Vermont; and this is a credit to your

State, as well as to the originator of the apple, Mr. Gideon Peter and the Gideon are also valuable varieties. What we need a few more such apples as the Wealthy, that are long keepers; and I hope that Mr. Gideon, or some other Northwestern man, will produce the desired fruit.

There is a lesson here that we all can profit by. My advice is to advise every man to plant all the good seeds from all the good apples that come in your way. It is an old saying and a true one, that one seed of an apple will give a corresponding apple of the parent; the seedling may be better or they may be inferior. I know the kind of seedling I have planted in my orchard, in Grundy county, and I know of one hundred and seventeen different varieties at the Storey County fair one year—distinct varieties. Many of them were very good apples; some were very poor. I have some kinds on which I have taken five or six state premiums, in Iowa. By my experiments in this way it has been the means of enlisting several of my neighbors as farmers in the growing of seedlings down there. I have been growing them for the last ten years. I believe if those present would take the seeds of our native seedling trees, crossed and fertilized with our Russian varieties that we would succeed in a few years in producing the very best apple which can be grown anywhere, and that we would soon place apples within the reach of every farmer of this Northwestern country.

In this book there are over fifty varieties of apples mentioned. While I am talking, there is one new fruit mentioned of a seedling of an unknown parentage, originating, I think, in South Carolina, which is said to be devoid of either blossom, seed or core; it is said to be a very good apple, keeping till April and May, in its own climate. It is something I never read of before, but it is in print here and I suppose it must be true. It is a sweet apple, of deep, orange yellow color, and the season is claimed to be from April to May; an unknown seedling. How true it is, I would rather say after seeing the apple.

This seems to be an instance where a new variety of apple has originated by the planting of seeds, originating a variety destitute of seeds, and nature having done the balance.

If this Society will adopt the plan of establishing experimental stations and will take some of its best men, who will give their time and who will work at their leisure at experimenting in a practical way, you will find it of advantage and you will be improved by it the whole of you.

Mr. Harris. These reports of the Department of Agriculture

valuable, and I think the majority of the people who receive from their members of Congress do not appreciate them properly; but every horticulturist ought to have the last one and just as many of other numbers as he can get. Probably Commissioner Colman should send a copy to anyone who would write for them. Members of Congress can mail them to people who would appreciate them and whom they would be useful. I would recommend that members of the Society write to their members of Congress and request that a copy of the last report be sent to them and as many as can be had of back numbers, and they will be sent to them free of charge. Mr. Thompson. I think there were seven or eight thousand copies printed for general distribution.

President Elliot here announced that anyone on payment of a dollar became a member of the Society and entitled to copies of our report, bound in cloth.

On motion of Col. Stevens the meeting was adjourned till 7 o'clock.

----- EVENING SESSION.

TUESDAY, JANUARY 17, 1888.

The meeting was called to order at 7 o'clock, P. M., by Vice-President, who stated the first thing in order upon the program for the evening, was the delivery of the President's Annual Address.

PRESIDENT'S ANNUAL ADDRESS.

Members of the Minnesota State Horticultural Society, Ladies and Gentlemen:

We have come together once more to take up the horticultural review of the year's work, and draw from it some conclusions worthy of consideration for our instruction. The vicissitudes of the year have been manifold and exhibited in various ways. With all of us the year has not been full of unbounding contentment, joy and happiness. Dame Nature has at times seen fit to cast many a threatening shadow upon our thoughts, deeds and actions. Some have been blessed with prosperity, happiness and good fortune, while others have been overwhelmed with affliction and reverses. Sometimes we have been on the mountain top in our aspirations for worldly gain and horticultural fame, at others deep down in the valley of gloomy discouragement and depression. The experiences of the past where they have been profitable and instructive should be treasured in our minds and

reviewed as we meet to greet each other in friendly discussion for improvement; for here it is we brush away the cobwebs from our minds, obtained by recluseness from the world, and receive new impulses, thoughts and conceptions of the possibilities and impossibilities of this labor of love to which so many of us have devoted our time, money and attention in trying to develop something that will be of use to future generations.

We come here this evening to take a retrospective view of the work of the past year and try to discern wherein it has been successful, and, if possible, the cause of our failures. Here we should be willing to discuss freely what have been our plans of operation, that we may develop or impart information concerning the progress attained, or describe new methods adopted in conducting our particular industry. If we have made failures, it is here we should be willing to discuss them, and, if possible, discover their causes. If we have been successful in producing something better than our neighbors, it is here we should try to impart that knowledge for the improvement of the whole; unless we believe in that trite but true saying, "It is always safe to learn, even from our enemies—seldom safe to instruct even our friends." As a rule our greatest ambition should be to place the knowledge we possess in the cultivation and management of our different crops at the disposal of all, then we shall be giving and receiving; this will be improvement in the right direction. Our new theories, new methods, new experiments are of little value to the world at large unless we are willing to have broad gauge ideas and spread them far and wide, imparting freely to each other what we have discovered that will be of value to mankind.

It is a true saying that those can direct best who can do best; and those can do best in any department of work who begin early in life, and learn by first impressions and experience much that can be learned in no other way. If this be true, we should endeavor to awaken an enthusiasm for the performance of horticultural duties at a very early age in the minds of the rising generation. This, it seems to me, is an important move towards solving this problem of profitable fruit raising.

The thought forcibly impresses us of the amount of time and energy that have been wasted by not understanding fully the relation or dependence of one part of the work upon another. Correct principles and ideas should be instilled into our minds at the beginning of our education, or we shall sooner or later be on the wrong road to success. A very dull scholar is he who cannot learn some new truth

experience. Benjamin Franklin said: "Experience keeps a dear school, but fools will learn in no other." The school of experience to many of us has been a very dear one, and want of system has been to many nearly as expensive. There is nothing that I regret more than that I have fallen into of doing my work in an unsystematic way; the older I grow, the more I see the necessity of having a fixed purpose in all classes of work, and systematic rules to

every young person should be taught that there should be a place for everything and everything in its place; also that there should be a system established for doing all classes of work, and it should be done according to the rule as near as possible. It is the unsystematic way of going through life that causes us so much waste of time and many of our failures.

Time is not all; many of us have acquired the habit of using up a great amount of time unprofitably. There is a quotation like this: "Every thread of gold is valuable, so is every minute of time." Time is the thief of time, and if we should make use of each minute with the mind directed to some particular object, how much we could accomplish. Show me a man that has methodical, systematic ways of doing everything with which he is connected, and I will show you a successful business man in whatever industry he is engaged.

RETROSPECTIVE.

Twenty-one years ago the thirtieth of the present month this Society held its first annual winter meeting at Faribault; a little band in numbers, but devoted in purpose; and the few remaining that came forward on that occasion and enlisted for the war, have never lost their interest in the good cause diminish, but have ever been diligent, faithful workers, untiring in their devotion, standing shoulder to shoulder, battling against the elements to make our industry capable of giving us employment, sustenance and satisfaction to the better impulses of our minds and added refinement to our homes. This band of persistent workers little thought that they would be called upon to meet or the discouragements to endure, and if they have had doubts and fears to overcome have never showed signs of being disheartened, but have ever met their faces to the front; if their labors were arduous they redoubled their efforts to make a success out of defeat. If their doubts changed into fear they have never murmured. If they have

increased in the minds of the people a desire or ambition to press forward this work of horticulture they so nobly begun, they feel well repaid for the toil of mind and body they have endured. As the saying now is, we are of age, and like the young men of our country we are now able to take on new responsibilities, new ambitions, new hopes, new desires. In looking back over the records of our past history we find, as in all other classes of business, many becoming discouraged have dropped out, but those remaining are devoted workers, wishing to perpetuate the same unselfish desire in those coming after; and it is to be hoped that whoever take upon themselves the burdens and responsibilities of aiding and sustaining the correct principles of horticulture in coming years, will bring more intelligent minds, as devoted hearts and as willing hands to help develop an industry that had its beginning in the Garden of Eden, and will ever continue to fascinate and attract the attention of mankind as long as the dews of Heaven fall, causing the earth to produce trees and plants to bud and bloom.

FAILURES.

Failure is an ever present factor that attends nearly every industry of any magnitude. The failures in trade in the United States in 1887 have averaged one to every one hundred and eleven persons in business; while the failures with those in horticultural pursuits I think have been less, yet there are more than there should be.

The reasons for our failures are not at first apparent, but on seeking after the known or unknown facts the true causes are developed; but then, as the saying is, "It is too late to lock the door after the horse is stolen." To obviate the possibilities of failure each enterprise should be scrutinized with care, caution and sagacity. Many times it is the want of a true system arranged in regular subordination to a well developed plan to be guided by a mind stored with knowledge based on practical and scientific principles for governing all our actions.

Our experiences in producing apples, pears and cherries have to a large extent been discouraging; now is there not a good reason for so many partial and total failures? When we consider the methods used in handling, planting, care and cultivation of fruit trees, I sometimes wonder that we have shown any good results. Still there are many places in the State where apple trees are yielding a proper remuneration or return for time and money expended. Many of our failures have come through lack of thoroughness in all our experi-

ts, in developing this class of fruits in a climate like ours. If standard of success with the apple has not been high, we have reason for encouragement in the successful cultivation of all of small fruits where we have planted them judiciously with their surrounding elements.

There is hardly any place so bleak but where some varieties of the small fruits will thrive and produce profitable crops when planted and cared for with intelligence, unless in some few exceptional cases under peculiar circumstances.

MARKET SUPPLY AND DEMAND.

Within the last decade great alterations have been produced for improving the business methods relative to increasing the facilities for handling and distributing large quantities of horticultural products expeditiously. Now, one of the first things to be considered is how a market can be obtained for produce, and how production can be adapted to the capacities of the market.

A few years ago our market gardeners held back in extending improvements, for fear of overstocking the market. Sales were slow, prices low, much that they raised was necessarily disposed of at a great sacrifice. New manure and machinery, together with greater intelligence in the use of fertilizers and management of sowing, cultivating, harvesting and marketing their products has served to revolutionize the whole system of market gardening, and create new relations with producer and consumer regarding supply and demand, that are alike beneficial to both. In this business as in every other, the more system introduced in the carrying of it on the better the chances of success; and if all used the same enterprise and judgment in their operations their expenses would be reduced, their profits increased, and a general prosperity prevail.

It always has been and always will be these enterprising, persistent men, who never fail in producing first-class products, and obtaining high, remunerative prices, that come to the front, prosper and are respected; and it remains for the shilly-shally laggard who always has a surplus of unshapen vegetables and fruits to sell to do the grumbling about our markets and low prices. I have heard it said by gardeners: "If it were not for these commission men that are shipping in such large quantities of fruit and vegetables, we could dispose of more produce at higher prices." Now those men do not stop to think what an important factor the commission or middle man is, or to consider if it were not for their tact, push and energy our markets would be much more

irregular in supply and prices; short at one time and overstocked at another. They are the great distributors and equalizers or balancing power that governs supply and demand, the market gardener's best support.

FORESTRY.

I do not wish to forestall the Forestry Committee's reports, only to add emphasis to what they may say with regard to the adopting of some definite plans for accomplishing what seems to be of necessity for the well-being of those interested in horticultural and agricultural pursuits. The subject of forestry is becoming of so much importance to the people of every State and Territory that it is attracting a portion of their attention which it so justly deserves. There should be some scheme devised for the reservation and protection of large areas of timber to the west and northwest of this point, to serve for the specific purpose of protection from storms of wind which sweep over this portion of the country with so much fury and cause such great loss of life and property. The ameliorating influences of this large belt of timber on our climate at this point is known to be very great; the thermometer here ranging several degrees higher in winter and lower in summer than west of the big woods. If such are the facts, that alone would be a good argument in favor of this scheme. Unless some measure is taken soon to preserve it for wind breaks and other uses, we shall have the dreaded cyclone sweeping through our streets and beautiful parks, laying waste our shade trees and dwellings. The acquiring now of large tracts of these fine timber lands, if protected and cared for properly, would have a tendency to increase in value the adjoining portions of the State; also it would be a good financial scheme as rendering future aid and assistance to many other kinds of industry. Many are urging reasons for experimental stations to be instituted to aid in growing tree seedlings for distribution to those desiring to grow timber. This is well enough, but better than this is to enact laws for the preservation and protection of the forests we now have, that have been planted by an indulgent Creator and so beautifully cared for by an all-wise Protector, until wasteful man took possession. I would therefore recommend that the committee investigate and suitably consider this great question of so vital importance to the prosperity and happiness of the future generations, and draft resolutions to be presented to the Society expressive of our desires and wishes on this question of forest preservation and protection, before adjournment

is said: "The fool and squanderer march along, heedless of the coming disaster; the wise man acts in time to prevent it."

NEW VARIETIES.

Those seeking to introduce new varieties of fruits or vegetables should exercise great care and judgment that none are sent out except of fixed character and value. Too many of us are solicitous for new varieties, when it would be much better for us to cling to the tried sorts; and we often do not stop to consider when we have introduced a new seedling tree, fruit or vegetable, whether it possesses qualities of acknowledged superiority, better than some kinds in cultivation, but send it forth for public favor regardless of its fitness, productiveness, quality, size, shape, color or texture, thinking it will come into prominence if we boom it with glaring advertisements. Until a variety has been thoroughly tested and found to possess many good qualities, equal to or better than those already in the market, it should be considered with temerity. We, as horticulturists, should adopt a conservative policy in regard to buying high-priced varieties. Many of us have bought our experience, sometimes dearly, and we should hoist the red flag of warning to caution new members and amateurs in the business. Until new varieties have been tested at a number of our experiment stations, we, as members of the Minnesota State Horticultural Society, should be cautious in recommending their sale or distribution.

HORTICULTURAL INSTITUTE WORK.

The special act of the legislature that created the Farmers' Institute also gave the president of your Society a voice and vote in its organization, electing of superintendent and supervision of his work; as your servant, entrusted with this responsibility, I have tried to exercise my best judgment, and act for the best interests of the Horticultural Society. If I have erred in the performance of these duties it has been the fault of the head, and not of the heart, for I have always felt that what was for your interest should take precedent in every and every action that demanded special, intelligent, thoughtful consideration in a broad-gauged, unbiased policy. I have taken some pains to keep posted in regard to the class of instruction that was being given at the various institutes in the interest of horticulture and the manner of its presentation, and I have to regret that we have not as yet been able to place such teachers in the

field at all times as the exigencies of the situation demanded, and the instruction in our particular interests¹ has come far short of meeting the expectations of many of our members, and those most deeply interested in the success of this class of work. The Farmers' Institute I consider one of the best mediums, when rightly conducted, for the dissemination of practical horticultural information among our farming population. In selecting and sending out those who are successful experts in their particular class of industry, it should be our highest aim to send out such instructors as are not bigoted and have no scheme to push for their own selfish ends outside of giving horticultural instruction, and unless we can find such instructors I think we should hesitate before recommending any one for this position. I do not wish to be understood as casting any reflections, but simply to guard against any contingency of this kind in the future. We must carefully consider the qualifications of our horticultural lecturers and feel sure they are worthy of the places they hold; if not our claim to the position of an intelligent, progressive horticultural society may be justly criticised.

OWATONNA EXPERIMENT STATION.

The Owatonna Experiment Station, created by special act at the last session of the legislature, has been started on the State School Farm under the care of E. H. S. Dartt, superintendent. Our Society has been honored in the selecting as superintendent of this station one of our members who has been long identified with the horticultural interests of the State, and whose experience in the past will help him very materially in deciding what to plant, as well as what not to plant. The task, allotted to him, to develop a practical, profitable, instructive example of object teaching to those children that will come in daily contact with his work, I hope will impress him with the great responsibility that rests upon him; and ample means should be provided for carrying on the experiments in such a way as will tend to store these young minds with knowledge that in after years will help them and us to solve the great problem of successful fruit culture in this State

I regret to report to you its beginning under adverse circumstances. The policy pursued by our legislature in not making available an appropriation to carry on an enterprise that is fraught with so much of benefit to the minds of those children dependent upon the State for support and education seems narrow. The supporters of this measure

done everything possible to advance the work and put it in to forward the purpose for which the station was created.

EXCELSIOR STATION.

Now that the experiment station at Excelsior is about to be abandoned would it not be best to transfer such stock as Supt. Dartt think best to his station? I would also suggest that a committee be appointed to confer with Prof. Porter, and through him with the Board of Regents, as to whether the one thousand dollars designed for the Excelsior station could not be transferred to pay expenses at the Conna station. If such an arrangement could be effected it would put that station in a position to go on and undertake valuable experiments at once.

TREE PEDDLERS.

The law that was passed at the last session of the legislature to prevent the practice of fraud by tree-peddlers and commission men in the sale of nursery stock was watched very close by those anxious to stop or prevent its passage if possible; and from the amount of letter and inquiry received, and the criticism this new departure has occasioned from very many of the nurserymen south and east of us, and lately and in their Nurserymen's Association meeting held last year we are led to believe that some of their agents have given warnings to their principals that the people of this State are taking means for the protection of those horticulturally inclined, who are annually defrauded by deceitful impositions in the sale of nursery stock. It may be a new revelation to the principals, and I wish I could honestly believe that such was the case. The law considers employer and employee alike responsible, and a business that has to constantly employ fraudulent means in the sales and distribution of its products to succeed is in a pitiful condition, and should be looked upon with disgust and aversion.

An inquiry into the means established to throw some restraining influence upon the methods pursued in the sale and distribution of nursery stock should very properly come before this meeting for a fair and impartial consideration. That the law has its defects and is not perfect is apparent, but complaints of swindling and fraud, by tree peddlers, have been less the past season than at any previous time for several years, which proves it beneficial and a decided progress in the right direction. We hope the experience of the past year may teach

us a better method to be used in the future to prevent our people being defrauded and help elevate the nurseryman's standard of honesty.

REFRIGERATION.

There is a new process of refrigeration about to be introduced into this State that has many valuable points of excellence. It possesses all the qualities for preserving meats, vegetables, fruits, flowers, food and drinks of all kinds in great perfection, in a very simple and effective manner. Its intensity of cold can be regulated from 40° above to 80° below as easily as you can turn on your city water or gas, simply by turning a stop-cock to regulate the amount of flow of material used for freezing from the reservoir through a coil of pipes within the refrigerator, where it condenses and collects in a similar tank or receiver placed at the other side, which material can be redistilled without loss and sent out again on its round of duty. It is said to be much cheaper than ice, and to give a much better atmosphere for preserving perishable goods from decay. This process will be invaluable to the market gardeners, fruit producers and dealers, on account of the possibility of lengthening the season. By it we can have apples that are now late fall, in perfect condition in April and May, and those we consider as winter apples the next midsummer and fall. By this process we may have the choicest varieties of fruits much beyond their usual season.

AMERICAN POMOLOGICAL SOCIETY.

The twenty-first session of the American Pomological Society was held in Boston, Mass., commencing Wednesday, September 19th, and continuing three days. Our Society was not represented by a delegate as we were needed at home to assist at our State Fair then in session. This has been a very unfruitful year in nearly every section of our State, and with the exception of grapes all the show fruits were unproductive, and it would have been impossible to make a creditable exhibition. The society made a wise choice in selecting as president Mr. P. J. Berkman, a man of liberal views and with experience in horticulture. It may justly be said that the society honored itself, pomology, and the man, when they elected him to succeed the lamented Marshall Pinkey Wilder, who served that organization so long and faithfully.

ORNITHOLOGY.

I wish to call your attention to that friendless bird the English

arrow, *Passes Domesticas*. Scientific research into the character and disposition of this untamed annihilator of horticulture and agriculture has developed some very startling facts that call for your immediate attention. If the following synopsis of the report, which was prepared by C. Hart Merriam, of the United States Department of Agriculture, be true, the friends should become alarmed at the sad havoc this foreign importation is causing among our friends, the native birds of America. The report says:

"The English sparrow is a hardy, prolific and aggressive bird, possessed of much intelligence and more than ordinary cunning. It was first brought into this country in the fall of 1850. It is domestic andregarious in habit, and takes advantage of the protection afforded by proximity to man, thus escaping nearly all the enemies which check the abundance of our native birds. Its fecundity is amazing. In the latitude of New York and southward it hatches, as a rule, five or six broods in a season, with from four to six in a brood. Assuming the average annual product of a single pair to be twenty-four young, of which half are females and half males, and assuming further that all live, together with their off-spring, it will be seen that in ten years the progeny of a single pair would be 275,716,983,698. In the year 1886 the English sparrow was found to have established itself in thirty-five states and five territories. In the United States the total area occupied at the close of the year 1886 is 885,000 square miles; in Canada it is not quite 148,000 square miles; in all 1,033,000 square miles. In the United States alone it has spread during the past fifteen years at the average rate of 59,000 square miles per year, and in the United States and Canada together at the rate of 69,000 square miles per year. Of all the native birds which habitually make their homes near the abodes of man, the martin is the only species which is liable to hold its own against the sparrows, and numerous instances are on record where even the martin has been beaten and forced to abandon its former nesting place by these beligerent aliens. The birds which have suffered most from the English sparrow are the robin, catbird, wren, song-sparrow, chipping-sparrow, yellow-bird, oriole, vireo, and blue-bird. Not only does the sparrow drive away and sometimes kill the adult birds, but when it finds their nests it throws out their eggs and young, and not infrequently feasts upon them."

WHAT THE SPARROWS DESTROY.

The sparrows cause a positive and direct loss to our agricultural

industries, amounting in the aggregate to not less than several millions of dollars per annum. Indeed, it is safe to say that it now exerts a more marked effect upon the agricultural interests of this country than any other species of bird; and its unprecedented increase and spread, taken in connection with the extent of its ravages in certain districts, may be regarded with grave apprehension. In the early spring it prevents the growth of a vast quantity of fruit by eating the germs from the fruit buds of the trees, bushes and vines, of which the peach, pear, plum, cherry, apple, apricot, currant and grape suffer most. Lettuce, peas, beets, cabbages, radishes and cauliflowers are attacked in turn, and devoured as soon as they show their heads above the ground, and in many cases the seed is taken out of the earth before it has germinated. The grape industry is also a heavy sufferer from the ravages of these pests. At the end of the season of 1886 bitter complaints of damages done the grape crop by sparrows had reached the department from twenty-five States and the District of Columbia, as follows: Alabama, Arkansas, California, Connecticut, District of Columbia, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia and West Virginia. Its consumption and waste of corn, wheat, rye, oats, barley and buckwheat, in many parts of the country is enormous. It feeds upon the kernel when it is in the soft, milky state, as well as when it has matured and hardened, and in fields of ripe grain it scatters upon the ground even more than it consumes.

In addition to the disfigurement of buildings by the nests and excrement of the sparrows, and the injury to ornamental trees and shrubs resulting from the same cause, it should be mentioned that they frequently damage and sometimes destroy the ivy and woodbine covering the walls of churches and other edifices. The destructive habits of the English sparrow in Bermuda, Cuba, Germany, Austria, Russia, India, Egypt and Australia are too well known to require more than a passing observation. In England alone the damage it causes has been estimated at not less than \$3,850,000 per annum, and in Australia the loss is much greater. It threatens to become a more baneful pest to the American farmer and the horticulturist than the grasshopper, caterpillar and Colorado beetle.

The report further suggests that legislative action be taken to stop any protection at present afforded the English sparrow; to authorize killing it; the destruction of its nests and young; and to protect the

her, sparrow hawk, screech owl, the birds which feed largely upon sparrows, and the appointment of one or more persons in every town to officially take measures for their destruction. The report also suggests several means by which they can be exterminated, among them being by firearms, tearing down their nests with an iron rod or hook, and driving them from their roosts by turning a stream of water upon them. In this connection it should not be forgotten that the English sparrow is an excellent article of food, killing many of the smaller game birds.

IN CONCLUSION.

Every member of our Society, for the attachment they entertain for it, should feel a personal desire to promote its welfare at all times and in all places. They should employ their best ability, ideas, desires and efforts to contribute to its advancement, and help adjust the many perplexing difficulties to be overcome. Every opportunity should be seized for establishing in the mind of some man, woman or child a love or desire of becoming proficient in the art of cultivating beautiful flowers that shall please with their perfume the delicate sense of smell, or delicious fruits exciting enjoyment to their cultivated tastes, or splendid trees that shall impart a pleasant shade from the midday sun and give shelter to their declining years. With each neglect of this should leave a feeling of duty unperformed. Sometimes a look or word of inquiry may be the means of exciting interest and creating desires for developing some beautiful feature for pleasure that will unfold and illustrate some fundamental truth over which we have spent much time.

The æsthetic studies in horticulture are each day disclosing to the inquiring mind some very valuable examples worthy of our closest attention, and as we seek to solve its many vexatious problems we begin to comprehend how intricate are her processes and little our knowledge of the governing laws of nature. "Tall oaks from little acorns grow," so we must develop step by step, year by year more scientific methods of obtaining information from each and every source attainable to make more perfect a system of rules serving to guide us in performing with greater dexterity the duties devolving upon us as men and women who have assumed the pleasing responsibilities of solving a few of the concealed mysteries that excite our curiosity when we try to develop fruits, flowers and vegetables in their greatest perfection, adapted to a climate as variable as ours.

1. Grub up all your extravagant customs and revolutionize your habits, that the law of your being, a kind of second nature which grows within you, may be radically changed.

2. Break up the soil that covers your dormant brain, and eradicate all the old weeds of dissatisfaction, and begin anew a more advanced class of cultivation.

3. Fertilize your minds with ambition, greater aspirations, and desire for larger usefulness.

4. Sow the seeds of prosperity, success and good fortune by adopting the truism of one of America's most noted men: "He that by the plough would thrive, himself must either hold or drive."

5. Cultivate special attention and study of the three virtues, Faith, Hope and Charity, with a view to valuable returns as payment for your industry.

6. Prune off the unnecessary sap suckers of wastefulness and prodigality that rob your business, steal your resources and bring want and failure in place of success and prosperity.

7. Cut away your needless indulgences, vices and faults, things not needed in the every-day life of sensible fruit, flower and vegetable raisers.

8. Reap a harvest of happiness in the felicity of elevated perceptions and blessedness from the pursuit of social and benevolent affection, and the promised bliss of the great hereafter when remembrance of failures, discouragements and losses will cease.

9. Market unbounded charity and good will towards those who cheat and defraud the innocent, inexperienced, upright amateurs in horticultural pursuits.

And finally, brother co-workers, when we go hence to our homes and occupations, do not hide the zeal and enthusiasm here acquired, but go forth with fixed purposes of faithfulness, persistency and devotion to the cause we maintain and the principles we espouse.

The reading of the address of President Elliot was received with applause and marked approval.

On motion of Mr. Gould, a committee of three was appointed upon the recommendations of the President, as follows: G. W. Fuller, J. S. Harris and A. W. Latham.

President Elliot stated that, owing to the illness of Mr. Stubbs, who was to prepare a paper on grape growing, he was not able to be present to read the paper, but it would appear at the proper place in the report.

GRAPE GROWING. •

By N. J. Stubbs, Long Lake.

do not consider there is any great secret or mystery about growing grapes, and it seems to me it is fully time that everyone who owns a portion of "God's acre" should realize this, and not longer neglect planting and rearing of this luscious fruit.

Grapes have ever been the constant companion of man from the earliest dawn of civilization to the present time.

The vine is likewise the emblem of peace and prosperity, always bringing much to the comforts of home life.

Stamped on the memory of childhood are recollections of pleasures that in our declining years we love to recall with joy and delight.

If you have concluded to plant one vine, or a thousand, in either case select the warmest spot you can find, for heat is pre-eminently essential to make success of this fruit. This is generally to be found in this country on somewhat elevated land, near a body of water, the land inclining to the south or southeast, with a goodly share of sand mixed with top soil to attract and hold the heat of the sun. Such a situation, with a clay subsoil mixed with limestone, will prove very satisfactory for growing grapes.

Select good, strong, two-year-old vines, grown from cuttings, six or eight inches long, so you can be able to plant at least one foot deep, to avoid winter freezing and summer drouth, for undoubtedly many failures here in the Northwest can be traced to roots grown from single cuttings and shallow planting.

Clean your ground thoroughly of all impediments that would in any way retard the cultivation of the soil among the vines. Work the ground to the depth of one foot or eighteen inches. Harrow and mark the rows eight feet apart each way. Some varieties of grapes that are slow growers would do closer than this, but this distance is best for most varieties. The best plan is to use a trellis and cultivate crosswise of the hill, or rolling ground, to prevent washing of the soil from the vines. The first year after planting keep the ground well cultivated, leaving the vines to grow unchecked in the fall; cut back to the buds. The second summer we select the strongest and best buds and train to a stake, set well in the ground, unchecked as before, except to pinch all laterals off above the first leaf. If our work has been well done thus far, we have laid the foundation of our vineyard. In relation to the manner or system of training and pruning the vine, it would be folly, perhaps, for us to designate any particular one as

being the best, as circumstances and conditions may exist when any particular system would be "more honored in the breach than in the observance." But whatever system is adopted, the third season brings around the time when it is necessary to erect the trellis, which we make by setting posts of tamarac or oak, six feet two inches long, sixteen feet apart in the row, and two feet deep, leaving them about fifty inches high. To these posts attach four strands of galvanized No. 12 wire, one foot between each strand; fasten the wire to post with small staples, bracing the end posts well to keep the wires taut. Having the trellis completed, it would be well to consider a few important principles before we can proceed intelligently to train and prune the vine:

First—As a general rule, the fruit-bearing canes at this stage are grown from buds on the previous year's canes, or in other words, the wood of this year contains the buds which produce fruitful canes of next year.

Second—That *fruit* buds differ from *wood* buds only because of better development.

Third—That a cluster is a fruitful tendril, and that the ordinary capacity of a fruitful bud is to develop on an average three of these fruitful tendrils; although I have seen on the Eumelan and Elvira as many as five of these fruit bunches, or clusters.

Fourth—That it is an easy matter to overtax a young vine by leaving more fruit on it than it is capable of ripening without damage. A young vine cannot yield the crop that an old one may, any more than a young person can perform the labor of an adult.

Fifth—It is of the utmost importance, if we wish to insure health and long life to the vine, to keep the foliage, fruit and roots well balanced, for the relations of all parts are closely related and are constantly acting and reacting on each other, quite as readily as do the mind, body and brain of a living organism.

In fall pruning, cut the fruit-bearing canes so they will not reach more than half way to the top of the trellis. As the vines awaken from their winter's sleep in the spring, and the buds begin to swell and burst forth, it will be observed that two buds often appear from what seemed but one in the dormant state. The first and simplest operation, in summer pruning, is to rub off one of these buds, and all superfluous ones wherever and whenever they appear; a simple touch of the finger is sufficient. The weakest and lowest ones must go. If these shoots have grown a foot or more the necessity of removal is greater, and this must not be neglected.

times it may require a good deal of courage to destroy so many active clusters of fruit, therefore it is better to do it early. The remaining shoots are pinched off at one or two leaves beyond the last cluster of fruit, and all laterals are stopped in the same way as they appear. These bearing canes and laterals, after recovering from the check thus given, will soon recover and make a fresh crop in wood making, when the pinching process is repeated as before, leaving an additional leaf each time. The effect of this treatment is to retard the sap and retain it where it is most needed for the development of buds, leaves and fruit. The leaves remaining are increased in size much beyond their natural proportions, which undoubtedly adds to the vitality of the vine, its power to resist disease, also at the same time increasing the size of the fruit and giving it a finer flavor. This close pinching process also results in full, well-developed fruit buds on the canes to be left for next year's fruit.

Some advocates of long pruning claim that the third and fourth joints on a cane produce the best clusters, while others contend that the axillary buds, those that emerge at the junction of the young and old canes, will never produce fruit. But it will be observed that very much depends on the treatment the vines have received. If they have been allowed to grow at random and to take care of themselves, we must admit the vines will seldom fruit, purely from lack of development, the sap being allowed to pursue its natural course unmolested; there is no time to stop to develop buds. With judicious summer pruning these base buds are equal to the emergency. In fact, the short spur-system depends absolutely for success on this summer pruning. In our climate, where it is absolutely necessary to protect vines from winter by laying down and covering with earth, in order to secure a crop, the spur-system is probably the most successful, all things considered.

The following paper was then read by Mr. Sias:

THE TREE PEDDLER.

By A. W. Sias, Rochester.

President and Gentlemen of the State Horticultural Society:

"When you see him coming, call back your dogs; don't slam the door in his face, for you *may* entertain an angel unawares." These

true words were spoken many years ago before this Society by the late Dr. P. A. Jewell, whose eloquent words always carried weight, and commanded marked respect and close attention. Mr. Jewell was a "gentleman and a scholar." He had no haughty words of contempt for any poor mortal who peddled for a livelihood, whether on foot, or with a cart, providing he carried on an honest business. What we understand to be a "Tree Peddler" in Minnesota is a man who takes a load of trees on a wagon, or some other conveyance, most invariably from some home nursery, of hardy, well grown plants, and he carries these trees among farmers, who dare not order, owing to having been swindled so often, shows them just what he has got, and usually sells as low as the same stock could be purchased at the nursery. Now I am not aware that I ever peddled a tree in my life—but think I have known men in the business, as stated above, that were as honest and reliable as any man I ever dealt with. But is it not just *larely possible* that I was expected to speak of a very *distant* related animal species, known as the "Tree Dealer?" Please to excuse me for introducing an entirely new subject under the head of the "Tree Peddler." Now this animal usually known as the "Southern Tree Dealer," is in such marked contrast with the tree peddler that there is no danger of mistaking one for the other, no more than there is of mistaking a clod-hopper for a dude. You may also entertain a regiment of Southern Tree Dealers without the slightest danger of entertaining an angel unawares. And as President Elliot said in his annual address a year ago, "many of them have more cheek than a government mule." A friend living less than a mile from my place kindly handed me the following bill of plants last week that he purchased of one of the aforesaid tree dealers last spring, more than half of which are now dead:

4 Russian Mulberry.....	\$4 00
2 Rhododendrons	4 00
2 Paul's New Flowering Thorn.....	2.00
2 Camperdown Elm.....	4 00
2 Unknown shrubs.....	2 00
2 Cut Leaved Birch.....	4 00
	<hr/>
	\$20 00

There are two Scotch varieties of weeping elms, the Camperdown and Scampston. But what a scamp a man must be to charge two dollars for a small elm tree. Such a man should be made to scamper down and out, in a hurry.

Our new law to protect planters against fraud by tree peddlers and dealers is in no sense a nurseryman's invention. While a very limited number spoke against the gross frauds that were continually being practised upon the farmers, I am not aware that a single nurseryman helped to put the law into its present shape. I think they would prefer free trade with Canada and all other countries, and very much regret that the robbery of the "tree dealer" should have been the cause of such a partial and restrictive law.

I wrote President Patten, of Iowa, if this law would work any injury to horticultural pursuits in Iowa, and he replied: "Yes, it cripples small nursery establishments all over the northern half of Iowa, and lets in the big bugs who can put up the bonds, and drives honest competition out of your State, and allows those who can sell to have an excuse, and a reasonable one, too, for asking bigger prices for their stock. The law was thoroughly canvassed at the last National Nurserymen's Convention, at Chicago, and thought by a large majority of the most intelligent men there to be a clear infringement of the inter-state commerce law; and there is no doubt but that if a suit was brought under your law, that an association of nurserymen could conduct it, and they believe it would be declared unconstitutional. They regard it as substantially so decided in a decision by the United States supreme court, made in Tennessee last fall. Such legislation will never be tolerated in this country."

E. De Bell, president Dakota Horticultural Society, writes under date of December 29th: "In regard to the Minnesota tree law, the only objection that might be urged against it is its discrimination against nurserymen outside the State of Minnesota. Yet if each State had a similar law it might be called an offset. Nursery firms with large capital are able to give bonds for a large number of agents, while the poor (because honest) nurseryman is excluded. I do not know of any way by which this can be avoided. On the whole I think the law a most excellent one for Minnesota, but hard on Dakota, until we get a similar one, which we shall endeavor to do." Whether the law is constitutional or not I am unable to say. There is a question whether or not any State has the right to discriminate in any legitimate business in favor of residents of its own state as against those of other states. A nurseryman in Wisconsin mentions as one of the good results of our law restricting "tree dealers," that the better class of agents formerly working for "hefty" firms further East and South, whose nurseries were as extensive as the poor man's pasture (viz., the whole length of the highway), and existed only on paper—he says

they are leaving these thin concerns and seeking nurseries further West. Men who want or are compelled to do an honest business, and submit to your law. "I wish to know the meaning and intent of the law. Are you obliged, in case you want to buy a currant or strawberry plant outside of your State, to take out the \$2,000 bonds? If so, it will seriously interfere with the local trade, and throw it into the hands of the large firms at such prices as they may see fit to ask, shutting out competition from other States."

Another letter from one of the foremost horticulturists of Wisconsin, or the Northwest, either, writes: "I do wish I was lawyer enough to tell you about that law against tree peddlers, but I am no lawyer. You must have had it long enough to tell how it works with you—whether its prohibitions prohibit or not? The proof of the pudding is in the eating. Does it so far work well? Does it protect the people? You and I would prefer a more educational preventive course—but alas! alas! this is "a free country!" Evil free; good enslaved. * * * Hope you will give full reports of its working as far as tested in this winter meeting."

Chas. Gibb writes under date of January 3d: "I have read in your Minnesota State Horticultural Society Report your recent law regarding tree peddlers. The law is a hard one, but I must say I like it, though you may find it well to amend it in some way. In former years our trouble was the sales of the cull trees at Rochester, N. Y., which were bought by agents and sold in the remote parts of the Province. They were often labeled according to orders, and gave people the impression that they could not grow apple trees. As a protection against this, we, together with those of Ontario, asked the government to put on more duty. The duty adopted was apple trees, 29; pear and cherry, 49; and plum 54 each. You ask if your new law is likely to work any injury to the provinces. If Ohio, New York and Michigan trees are doing harm, surely Ontario trees are also likely to do so. You must look to the interests of your State, and you have given us some ideas which it might be well for us to consider and act upon. I am glad the Dakota Horticultural Society had a good meeting. Sorry I cannot be with you on the seventeenth."

The Provinces have no grounds for complaint. While the duty on trees, as shown by Mr. Gibb, amounts to almost a total prohibition on their part, we allow them to ship us plants, trees, shrubs, and vines of all kinds, except medicinal seeds not especially enumerated or provided in the act last passed. Roots, seed cane and seeds imported by the Department of Agriculture or the U. S. Botanical Garden, fruit

ants, tropical and semi-tropical, for the purpose of propagation or cultivation. Fruits, green, ripe, or dried. all duty free with us.

The Province of Ontario extends down between lakes Huron, Ontario and Erie to about latitude 42, which gives them a most genial climate from which to furnish Minnesota with all the Russian apricot trees she may need at the low figure of 75 cents each—low considering their great bearing qualities in this climate—as we have it from a reliable Tree Dealer that some one produced 300 bushels of them from a small orchard last year at Brainerd, Minn. There they can furnish us with all the following popular plants in our State, viz: paw paw, egg plums, peach, pear, nectarine, Baldwin, Mann apple, strawberry tree, blue rose, and blue blazes! all free of duty! Who says it is not our duty to avail ourselves of the rare privilege to stock up on Ironclads at low figures. Go in grangers, farmers' alliances, and monopolists!

We happened to have a friend at the nurserymen's convention in Chicago last June, through which we glean the following items:

Nurserymen here from all parts of the country, and nearly all disgusted with the Minnesota tree law. Some twenty or more of them have pledged themselves in the sum of \$75 each (which amounts to \$1,500 or more) to test the constitutionality of this law, and to secure to all the right of equal business privileges. Now, Mr. President, I am no lawyer, neither do I wish to assume the place of both judge and jury as to this law. I am well aware that all you expected of me was to open up the subject for discussion. This I have done as fairly as possible, showing the dissatisfaction on the one side and merely touching the gross frauds on the other. That we have a legal right to assist the tree planter to defend himself against foreign tree impositions no sensible person for a moment doubts. On the other hand, if this law allows and encourages every farmer in leaving his regular business and becoming a Tree Dealer because they can club together and send out of the State for what they want without giving bonds, while the nurseryman near by has been waiting upon them, and experimenting for their good and profit, till he is so poor that no one will sign his bonds, "must take a back seat."

Gentlemen, I am inclined to think with Mr. Chas. Gibb, that you may find it well to amend it in some way. It does look the least bit oppressive to say to a nurseryman that is too poor—as Prest. De Bell says "because honest"—to procure the bonds, in case, for instance the poor man thought he must have a dozen Jessie strawberry plants from Wisconsin—to put him under \$2,000 bonds "to keep the

peace," for this small offense does seem rather hard. In conclusion (as last years' wheat crop was a light one) I will suggest to the farmers who have been so grossly defrauded by Tree Dealers (mind you I do not say Tree Peddlers, as they are a far more respectable class) to come out as did the patriot of old and say: "Let the wheat lay and rot on the field where it grows, and the reaping of wheat for the reaping of foes."

DISCUSSION.

Mr. Pearce moved that the paper be filed for publication, which motion was carried.

Mr. Gould. Mr. President, I am one of the number that opposed the enactment of a bill of this character a year ago, and I have not changed my mind in that respect as yet; and with all due respect for all that was said upon this subject at that time, I must say in all candor and sincerity that the whole thing in my opinion is a mistake. Without passing any reflections upon the integrity and good intentions of those who took action in the matter, I would say now, after having had some experience in the nursery and tree business—I am out of that business at present—that I think there ought to be an amendment to that bill. Every tree peddler, every man who offers a fruit tree for sale, in connection with the offer should say to the person to whom he offers the tree that he don't have any faith in it that it will ever bear fruit, as for thirty years the effort to grow fruit has proved a failure. I think that is a fact; the trees that survive are very few. Of course we don't expect to raise cherries and peaches, nothing of that kind; but apples—I am speaking of the hardiest kind of fruit trees—apple trees. And I believe that after this winter of 1887-8, the trees that will be alive that bear apples will be very few and far between.

Mr. Pearce. They will be good ones, though. Mr. President, when this proposed enactment of a law in regard to the sale of nursery stock was under consideration, as you remember, I was opposed to it all the way through. It is well known that I don't believe in peddling fruit trees of any description in Minnesota. I think that after the millions of dollars of money that have been wasted in Minnesota, it is almost equal to robbery for a man to go out and sell fruit trees in the way that they are generally sold, as has been the custom here for at least thirty years, to my own personal knowledge. I am perfectly willing that everybody who desires should set out fruit trees; that they should be grown everywhere in the State; and if anybody wants

set out fruit trees, let him go to the nurseries and get the trees at a reasonable price; that is where I stand. I am opposed to the tree pedlers in any shape or form in Minnesota. When it comes to plants, it is a different thing. If fruit trees are going to be sold by agents, I am in favor of asking the legislature to repeal that law.

Mr. Harris. Mr. President, I did not oppose the enactment of that law, and I do not oppose it now. Mr. Pearce has not made his point, I have not understood him. The law does not prohibit the selling of fruit trees. To compel us to send to the nurseries and get them would be pretty rough. In regard to this law, we did not expect a perfect law. We knew it was very imperfect, but we had to take what we could get. I think there can and should be some amendments made to it. I think the legitimate nurserymen, who have a few acres planted in a nursery, who are doing an honest business in the State, ought to have the right, if they want to obtain a dozen grape vines outside the State, to do so.

Mr. Pearce. In that respect it does not affect the nurserymen in this State.

Mr. Gould. That is the trouble, it does. I claim an honest man can't do business in Minnesota and sell nursery stock, if I understand the bill.

Mr. Harris. I think after the law has been in operation a short time we can see where it comes short, and can have it amended. The law has worked well in our part of the State. In one instance a party took a few orders on Saturday. On Sunday a member of this Society happened to be near there, and on Monday morning he went with the man who had given the order to see the agent and called for his papers, wanted him to show that he had given the bonds up here at the title. He was selling stock for a firm in St. Paul that don't own a nursery. He could not produce the necessary papers, and they kept him just so long a time to get out of town, and he got. There was another similar instance in another portion of the county. The party was operating who could not show any authority to sell, and he was informed that if he took an order in the place he would be prosecuted, so he left. So there has been very little of that kind of work done in that part of the State.

I think we should keep the law we have until we have tried it a little more thoroughly. It doesn't prohibit any man sending where he wants to for stock. I think anybody can order stock. The legislature has a constitutional right to levy a tax upon every citizen of the State to help support the government. It seems to me that it is con-

stitutional to put some check upon these scamps who are traveling through the country selling worthless nursery stock, for they are nothing more nor less than that. They should be made to take out a license. Pack peddlers are required to pay a license, and why should not the tree peddler?

Mr. Dartt. I don't see as it can make any material difference just now whether we are in favor of this law, or opposed to it; it cannot be changed before another winter, and I don't know as there is any use of our taking action in regard to it. We will have plenty of time another winter, if we want it changed, to make an effort to get the change made. I don't think I opposed the passage of the resolution very much, or said very much in favor of it; but I think I did warn our friends to be cautious, and not ask the legislature to pass a law they did not want. First, to be sure that they wanted it before they asked the legislature to pass it. I did so on the ground that this Society ought to know better what the interests of the State required in this regard than the legislature. I still think so, but it seems to me as good a thing as we can do now is to lay the matter on the table.

Mr. Thompson. I met one of these tree peddlers in Fayette county, Iowa, yesterday, on the train. He had one of your Minnesota licenses in Iowa, in our prohibition state. [Laughter.] I thought it was queer. He directed me to call on L. L. May when I came to St. Paul. I informed him that we Grundy county farmers were acquainted with that name, but I did not know whether his license was good or not; we had a "prohibition law" in force, and I thought he would have a fine time selling his trees. By the way, this same firm was operating in our part of the country quite extensively a year ago last spring, and if there was ever a set of farmers defrauded and robbed, it was our Grundy county farmers. A year ago this fall there was one set of agents of L. L. May, and another set of commission men that represented the Chase Nursery, of Rochester, N. Y., that were operating there to some extent. They bought their trees of Mr. Speer, of Cedar Falls. They got two loads of trees that had been condemned by him, and brought them to Grundy county. Some of the trees still had tags on them. On inquiring of the man who drew them down, he said he got them where Mr. Speer had piled them up intending to burn them, and that they gave him \$5 to draw the load of trees to Grundy Center, which he did, thinking there was no harm in it; but when he returned Mr. Speer discharged him. They had all manner of names for the trees which they peddled out to our Grundy county men, but as good luck would have it, not more than one in a hundred lived, so they

y lost their time and the money advanced. These are what we "pocketbook emptiers" and "scalpers" in our part of the country, and of honest nurserymen. We want no tree that has been grown of the Mississippi river for Iowa planting. When farmers will patronizing these traveling agents, take only home-grown stock, and plant it when it is alive, and take judicious care of it, then there will be less complaint than there is now-a-days from worthless trees. I had a little bit of experience this summer. One of your residents of this State came down our way, and he was introduced to some of our friends. He was no more fit to handle an apple tree than a boy to pilot a steamboat. Some of our men in our county bought trees of these agents at big prices; they threw them into the cellar, never covered up, never went to the railroad depot to get them until fifteen days after they were brought there. Of course the trees did not grow the next season. One neighbor who set out the trees used his land for a hog pasture, and because the trees would not stand against the winds and the dry weather, he complained that the trees "went to the root" and turned around to the agent and wanted to know if he could refill the order. The agent told him he would, and asked him what he wanted; opening his canvass he asked him to take his money; he replaced them with Hyslop crabs. Whether he will be able to make a good stock-yard with those or not I don't know, but he is going to try the experiment. When we have such men as these to handle fruit trees it is no wonder we have failures. Until these methods pursued I was a little down on the scalpers.

Mr. Pearce. I would like the Society to take some action, and to pass before the State in a proper light. This whole thing is a blot on this Society. I took advice upon that law from a good lawyer, and paid him for it. He told me the law wasn't worth as much as the paper it was written on. It is a mere scarecrow, and I would like to have an expression from this Society in regard to its repeal or repeal.

Mr. Gould. Mr. President, I supposed this paper was read with the intention of having a general discussion of the subject here. I did not point out my objections, and will not do so if there is no opportunity given for discussion.

Mr. Underwood. I was about to ask, what are the objections to this law? I have failed so far to catch any particular point, or objection.

I never took any part in framing, or assisting to enact the law. I don't quite see the necessity of it, because I have always been a considerable of a "free trader," although I have always trained

in the Republican ranks. I don't know that I heard what the objections were. Of course, if it is not really lawful, or is unconstitutional, why that is a matter which would bear investigating, and it ought to be, perhaps, if it is so considered by those who have given it attention; because we do not want, as a Society, to be placed on record as assisting to enact a law, or being responsible for a law, that really don't amount to anything. We want to be dignified, and to be careful of what we do; but I am perfectly in sympathy with the idea that we only want to do what is endorsed by the State Horticultural Society. Having asked the legislature to pass such a law, I don't see how anyone is to know whether it is of any account or not without making some inquiry; and if there are any of the gentlemen present who have been taking notes of the operation of the law, I should think for the matter of discussion, inasmuch as that is what we are here for, now that the paper has been read, that we ought to know what the objections are, so I shall be able to vote and act understandingly in the matter.

Mr. Dartt. Mr. President, I feel opposed to taking any action on this at the present time for the reason that the action will do no good; we cannot annul that law; it will stand whatever action we may take, and inasmuch as we cannot change it I think it is better for us to say nothing about it at present. One gentleman says we want to maintain the dignity of the Society. The question is whether we want to maintain its dignity as much by keeping still as we will by showing that we have changed our opinion since last winter, unless we have changed it for some good reason. If there is any benefit in it as a scarecrow let us have the benefit. But if there is not any benefit in it and those who oppose it want to contest it, why they can do so just as well as if we passed resolutions in regard to it; our action won't make any difference. Let us leave the subject without any expression on our part, merely on the ground that the time has not arrived for us to give such expression of our views. If we take an expression against the law, and say it isn't good for anything and we don't want it, why then we would want to use all the moral power we have against it; but I doubt whether that would not be like boys' play. Now, I think the law has done some good probably, and that it has proved not to be a serious hardship to the nurserymen of the State. Of course they can't buy stock to sell again out of the State. So far as these apple trees are concerned that my friend wants prohibited entirely, I don't believe we want any law for that; I believe that the people have made up their minds that there is not much use to

plant apple trees. I don't believe a canvasser could go through the country and sell a very great many apple trees at best. I hope there won't be any action taken on this matter only to lay it on the table.

Mr. Gould. Mr. President, and gentlemen of the Horticultural Society: There are two objections, to my mind, that are serious ones, that are worth considering at any rate; and the very thing that my friend Mr. Dartt referred to last was of the number I had in mind. It is not supposed that a dealer in this State raises everything he sells; it is a general thing that is an impossibility. The truth is it is better for the nurseryman to buy some of his stock; he knows where to buy it and have it pure and sufficient in every respect for his customer. I have been in that position fifteen years or more and have always bought more or less stock outside of the State. While I have made some mistakes and delivered some things that were not true to name, and perhaps things that people had better not bought, still I think I have done about as well as most men engaged in the business in Minnesota. I know it has been very convenient for me to have an opportunity to buy outside, and it is the same with others. It is just as well for the customer also. The most serious objection, perhaps, is that if this thing was carried out fully it would make a monopoly of the business; the customer and the farmer would suffer, because there would be no competition in the field worthy of the name. Of course I care nothing about that personally as I am not now interested in the business; but these are points I wish to make as I see the matter in that light. These facts will be conceded by my friend Dartt that we can get good stock in Wisconsin, Illinois, and even Ohio and New York. I would just as soon have a grape vine grown in Texas as in Minnesota, and it will ripen just as early. I think the same would hold good with raspberries and strawberries. I believe this law is unconstitutional. I think there was a decision in Texas, on a similar law, within a few months past, but this has nothing to do with that. We are not supposed as a society to pronounce upon the legality of the act, but I would like to see an expression taken upon it. We ought not to be so modest that we cannot acknowledge a mistake we have made. I don't hold myself responsible one way or the other for its passage, and I would like to see some action taken upon it.

Mr. Sias. This is what some claim to be class legislation. It seems that there should be some way to protect ourselves against these gross frauds without casting odium or contempt upon other honest nurserymen here in the Northwest. It seems as if this thing was gotten up entirely to protect such men as these consummate fools that don't

know any better (up here along the line of the Northern Pacific than to buy apricots, which Prof. Budd says may do well south of parallel 41, and in tropical latitudes. Now, in order to protect nurserymen, we put every nurseryman in the Northwest under two thousand dollars bonds to keep the "peace," as someone has it. It seems to me we ought to have some way to protect ourselves from these frauds, but most of the nurserymen seem to think we have not hit the right thing; they do not doubt the honesty and good intentions of the nurserymen who got up this thing. I haven't a particle of feeling against them; I believe they did it for the best. They supposed they were working for the good of the greatest number. But I think with Mr. Gibb, of Canada, that the law needs to be amended.

President Elliot. I have listened with a good deal of interest to what has been said. I suppose if there is any one man in this organization that is responsible for the passage of this law, that I have a share. I know I put in considerable work to secure its passage, and I know how it was fought in the legislature by the tree nurserymen. I know from the time we started with it until its final passage, with determined opposition. The law has some features we did not attempt to put in it, and they were perhaps put there by the tree nurserymen themselves.

Mr. Dartt. To make it odious?

President Elliot. To make it odious. We were obliged to pass such a law as we could get. We wanted some barrier put up against these wholesale frauds. When a man comes into our country and attempts to peddle stock grown in the South and East, and say just as good as Minnesota grown stock, he is stating that which we know to be untrue. Experience here has taught us all that we must get to come down to our own home-grown stock if we ever expect to raise any fruit. Now, we may have put our foot into it in passing this law of this kind, but where there is so much squirming among Eastern nurserymen and tree dealers, it shows that it must have hit somewhere; it hit a tender spot.

President Colman, in his address before the Nurseryman's Association, in 1886, called the attention of nurserymen to the method practiced for the distribution and sale of nursery stock, as not being what it ought to be, when the business is conducted upon right and business principles. And every time a man that is not interested in the way, either in the sale of stock, or a member of a nursery association, or something of that kind, if honest to himself and tells his honest convictions, he will tell you that it was for the

and that we had this bill passed. It isn't to protect the nurserymen, the tree dealer, but to protect the people, who are being indled.

Now, if there is any possible way to protect the innocent, we ought to do it. I have looked upon the methods practiced by some of these agents with a good deal of disgust. I started in the nursery business at one time, feeling that I could carry on the business honestly in a legitimate way, and feel that between my own conscience and my customers that I was doing an honest, upright business. But soon found that if I put an agent in the field I had to throw principle away. There is no man that sends out a tree agent that can govern his agents, as a general thing. Where he is selling on commission he will sell that which he can sell to the best advantage, it makes no difference whether it is a crab apple or a Rhododendron.

It seems to me it is all boys' play for us to pass any resolution saying that we will take back all that has been done in regard to this bill. As Bro. Dartt says, it will amount to nothing to take any action at present.

Secretary of State Mattson is probably as well posted as any one as to the working of the law. He has had considerable correspondence with parties in regard to it, and it has added to his official duties in giving the oversight of this law. He says the workings of it are all right.

So far as the objection as to its constitutionality is concerned, we had that passed upon by the attorney general, who gave us his opinion that it was all right—that it was constitutional. What the judges may decide when they get it into the courts is another question. But until it is carried there I shall consider that it is just as constitutional as any law we have. Furthermore, if we have no right to prevent these men from coming in here to defraud and cheat and lie to us innocent grangers, why is it we had an insurance law passed? Outside companies sent their agents here to do a dishonest business. Our insurance law has been upheld by the courts, I believe, and these foreign agents have been withdrawn from the State, and now insurance men are doing a legitimate business. An insurance commissioner is appointed to look after all the insurance business. Why should there not be the same propriety in having a wholesome law to prevent nurserymen from defrauding the people? I think if we discuss the thing on all its bearing we will find that we want to protect the innocent, the people, and that the men who are making their hundreds of thousands of dollars here, selling their nursery stock, are the ones we want to guard against. [Applause.]

Mr. Thompson. While listening to the remarks, it occurs that it would be a good way to test the law by each one seeing if it is rigidly enforced. You will soon find out whether it is constitutional or not. Our friend over here says one lawyer told him it wasn't. Lawyers sometimes tell the truth, but to my sad experience I know they won't all the time, so it won't always do to believe what they tell you.

Mr. Pearce. I suppose you consulted one, probably?

Mr. Thompson. Yes, and I paid him well for it.

Mr. Dartt. I call for the question and think we had better stop with further discussion.

Mr. Underwood. I don't think we want to choke off discussion. That is what we are here for; it is one of the things that come up and I say let the discussion go on. I have come here to learn something about this matter as well as the rest of you. I don't know whether the law has proven to be any damage or detriment to anyone or not, but I have not thought much about that, as I have been steadily pegging away. Of course I wouldn't like to say that I would continue to support the law, but that ought to be amended; and when the proper time comes, to amend it would be all right. Now, we had our committee of this Society to look up this law and frame the bill, and I have no doubt it was done with the best of counsel and advice; and we don't want to be like the eastern nurserymen about this thing. It is all right to discuss it and to be sure we are right. I don't care anything about these eastern nurserymen; they do squeal about it in their conventions. They may think they have the right to come in here and repudiate it if they want to, but I think it is unconstitutional; but they will never do any such thing, they have plenty of men and can put their agents in the field, and they will do so if they want to. Personally I don't think I would have such a law—just personally—just consulting my own personal opinion. I know this: that there is that cousin of mine who knows we are in the nursery business, and that all he has to do is to let us know when a collection of stock is wanted, that when an agent comes along he will pay \$3 for a worthless plant that would never grow any more. But what is the use, you might legislate till doomsday, but it never would break that cousin of mine; he would still continue to pay the \$3 for nothing. You must educate the people if you want to protect them to avoid these frauds; but if you can protect them by legislation, of course it is all right.

Mr. Dartt. If there are any real objections to the law it is time enough to have them presented another winter, and then the law amended.

President Elliot. You are connected with the Lake City Nurseries, Mr. Underwood. In the working of the law has it been any detriment to your business?

Mr. Underwood. I can't say that it has. Of course I haven't so much charge of the sales department, I am interested in the production; but I have not heard that it caused any detriment at all. In fact I would not have known there was any law of the kind so far as it has affected my business; we can't see that it makes any difference. Those gentlemen that talk against the law must do the talking. Still they will abide by the law I think. I could not say it has been any detriment to us, no, sir.

President Elliot. In my relation to this Society, as president, I have heard of no complaints further than one or two inquiries in regard to certain concerns in this city, as to whether they were doing a legitimate business. I looked the matter up and decided that they were so reported; further than that I have heard no complaints at all. Last year there were many complaints. A notice was published in the *Farmer, Stock and Home* last spring, requesting parties having complaints to make them known and they would be properly looked into; but we haven't heard of one complaint outside of those that come from nurserymen and agents outside, that wished to come in and dispose of their stock.

Mr. Underwood. Don't you understand that they can come if they want to?

Mr. Gould. Can't a nurseryman in this State send outside and get any Jessie strawberry plants and sell them here without laying himself liable to prosecution?

Mr. Dartt. He can if he will set them out and grow them an hour—he can take them up and sell them. [Laughter.]

Mr. Latham. Is that the way you do?

Mr. Gould. That is the difficulty. I am afraid it will make some of our people dishonest.

President Elliot. I pity the dishonesty with that class of people!

Mr. Latham. Mr. President, I understand the matter is still under discussion. There are a class of laws in force in Canada and Manitoba that are sometimes called paternal laws. It is taken for granted that the citizen is entitled to protection from the government. It is the same with the law we are talking about. There are quite a number of laws on our statute book of this nature, as for instance the law with regard to manufactured butter and the adulteration of milk, which are just getting into force, the insurance law, etc. The tend-

ency is to increase the number of these laws, and to throw protection around the general public. I think that is legislation in the right direction. I know many think that every individual ought to go it alone, but if our law could be amended somewhat it might be better; of course it is impossible to do that before next winter. It seems to me we cannot change the law now. We don't know now how it is going to work, and if all we want to do is to amend it to make it better, we had better take no action at this meeting.

Mr. Pearce. I think there are a good many improvements we can make. I didn't know but we might get ourselves into trouble. I went over to St. Paul. I have a brother there that has been in the law business for a good many years, and he looked this matter up carefully, and told me that any nurseryman could buy and sell and use, so far as the law was concerned; if anybody was a mind to contest it, which they would, it would be set aside. Now, on the strength of that, I bought rose bushes.

Mr. Latham. Let's send him up. [Laughter.]

President Elliot. This law was not intended to prevent a man from selling stock and conducting a legitimate and honest business. I know the law has met with opposition; it has, certainly. So it was in regard to our insurance commissioner. Men that were doing an honest business were protected as well after the passage of the law. It was only those that were committing fraud that needed to be suppressed. You will find by reading this law carefully that the object is simply to prevent fraud; it is right there in a nut shell.

Mr. Gould. It seems to me there is great danger of innocent dealers being prosecuted for damages; there certainly is.

President Elliot. Not if they are honest.

Mr. Gould. I claim to be just as honest as other persons, yet I had a claim brought against me of \$10,000, and if I had not defended myself I would have lost it, and I was not to blame at all; it was clear malice. Here is a case: Friend Pearce has admitted that he has transgressed this law. Suppose I get into a quarrel with him, and I take advantage of this. It seems to me there is a weak point in the bill. I wouldn't go into the nursery business with that law standing there, because I know I couldn't go into it and do a decent business and be restrained; and these gentlemen won't be.

Mr. Sias. I haven't a particle of doubt about the good intention of this law, and never had. But it reminds me of a certain party that I knew about in New England, a sort of bully, who lost some property; he traced the matter up and came to the conclusion that

man who stole the property was one of seven men that he knew, he said he was going to whip the seven men in order to be sure and the right one. That is about the way with this law; they date to whip every man in the Northwest for the sake of whipping the right man. It seems to me there ought to be some other way to get at it. I am just as much in favor of punishing these fellows as any of the rest of you.

Dartt. Mr. President, there seems to be no doubt as to the intention of the law. It was intended for the punishment of criminals.

The question comes up, what does it do? It is not what is the intention of the law, but what it does itself. I have read it carefully, and I claim that any man that ships in any article of nursery stock and does it without first growing it himself, or giving his bonds, is liable to pay a fine. That is the straight reading of the law. If this was so we could bring in foreign stock and sell it, as May & Co. did; but it was to hit just such cases exactly. You may say that if Bro. May wants to import a few plants he can do it. But if he can, why not Mr. May? Laws are made that way. I claim the law as it is hits those it was not intended to, but I don't believe our discussing it to-night will be productive of any good; we might better let it just as it is.

Secretary Hillman. At the annual meeting of the Society one year ago the committee of five, which had this matter under consideration, reported recommending unanimously in favor of the enactment of a law to prevent frauds in the sale of nursery stock. The legislative committee was expected to prepare a bill and to obtain its passage in the legislature. The one prepared was introduced in the Senate, and afterwards very carefully considered by the judiciary committees of both houses, and approved so far as its constitutionality was concerned. The object of the law was simply to prevent the practice of selling without bonds, and in procuring its passage the committee simply followed the suggestions of the Society.

President Elliot. I would like some expression as to whether there is any need of the law.

Mr. Latham. I move as the sense of this Society, that some law is needed for the protection of the poor from fraud and misrepresentation in the sale of nursery stock.

Mr. Underwood. I think that hardly covers the ground. We have the law, and why should we pass such a resolution when we already have it? As long as we have it, I think we want to pass a resolution endorsing the action of the legislative committee in securing the law that we already have.

Mr. Harris. I would like to see that motion of Mr. Underwood carried. This law was passed in the interest of the agriculture of this State, and if we simply turn around and ask to have it repealed without giving it a fair test, it seems to me they will lose further confidence in us.

Mr. Underwood. I make that motion. If we see after the workings of the law that it is not what is desired, why then we can recommend that it be amended so and so. But for us to take any other action than that, it seems to me would be out of place. And I would like to say, now that we have had a legislative committee appointed, in whom I have confidence to believe that they will do the best they could. The judiciary committees in the legislature considered the matter, and a prominent lawyer of St. Paul appeared before one of the committees in opposition to the bill; and since both branches of the legislature have passed upon it, and it has been only a year since the measure was passed, I say—while I don't see anything of the law, believing that every tub ought to stand on its own bottom, and that people ought to be intelligent enough when they buy a thing to know what they are buying; still I am in favor now of endorsing the action of that committee, and thus showing our confidence in them in what has been done. If it ought to be amended, it should not prevent endorsing the action of the committee.

Mr. Nobles. I second the motion, but I object to the amendment.

President Elliot. I understand the amendment goes further than the motion of Mr. Latham, and endorses the law.

Mr. Gould. I want to offer an amendment to the amendment in order to protect my friend Pearce and others. I am candid in saying that the nurserymen of the State should be protected; outside of the State I don't see anything wrong.

President Elliot. They are protected in this way, that if they file their bond they have a right to buy and ship as much as they have a mind to.

Mr. Harris. I suppose the filing of one bond is all that is necessary in order to conduct the business according to the requirements of the law.

Mr. Underwood. I hope we shall have confidence enough in the committee to endorse their action. Because a few nurserymen in the east have made a howl that should make no difference. And because some of our small fruit growers object to it is no good reason for refusal to do this; the simple matter of paying a couple of dollars for filing the bonds required, is a small matter, and it would have

matter all up and given them the right to ship in all the peach
es and high priced strawberry plants desired, and in the first sale
y would have got it all back. It reminds me of the druggist telling
at the profits of the drug business are. He said a boy came in and or-
red a small prescription and he told him it would be fifteen cents. The
y handed him five cents. Supposing he misunderstood him as he did
the package he said "fifteen cents." "Yes," said the boy, and took
e bundle and started off—it was all the boy had. As he closed the
or said the drug man "Well, go to thunder, I made three cents off
n anyway." [Laughter.] So you see you can get your money back;
t file your bond and the first bill of Jessie strawberries you sell
n get the money back! The question now is whether we shall en-
se the action of this committee. Another year if you wish to get
some amendment to the law it will be all right.

Mr. Pearce. I think friend Underwood is all wrong. That bill
s not passed upon by the Society. It was fixed up by the legis-
ature.

President Elliot. The Society took action on the matter and
tructed the committee to get such legislation as they thought the
ciety wanted; they did the best they could.

Mr. Pearce. We admit you did nobly; we didn't have any idea you
uld get anything at all.

Mr. Latham. But you see they did.

President Elliot. You should not have appointed the committee
d given them instructions what to do, if you did not wish any action
ken.

Mr. Pearce. The bill that was wanted was not the kind of one that
s passed by the legislature.

Mr. Dartt. Mr. President, I have been opposed to any kind of
ion. Now this resolution contemplates action, and means that we
dorse the law. If we are committing ourselves for or against the
w, I want to go against any action. I don't think we need to take
y action until next year, and then we will decide. If we don't want
approve of it, it seems to me we want to vote in opposition to this
olution.

Mr. Pearce moved to lay the motion on the table. Lost, by a vote
eight to seven, several members not voting. The motion of Mr.
nderwood was then carried.

On motion of Mr. Harris, the meeting adjourned till Wednesday
orning.

MORNING SESSION.

SECOND DAY, WEDNESDAY, JAN. 18, 1888.

The meeting was called to order at 9 o'clock, by President Elliot. The first thing on the program was the report of the seedling commission

REPORT ON SEEDLING FRUITS.

By J. S. Harris, La Crescent.

Mr. President and Members of the Minnesota State Horticultural Society:

I fully realize the importance of the work of the seedling committee, and only regret that I am not able to make it more effective.

The season was most unfavorable for the prosecution of our work, owing to the shortness of the fruit crop, which was probably caused by the severity of two or three previous winters, unfavorable conditions of the weather in the season of blossoming, and the severity of the drouth that prevailed during much of the summer.

With the exception of one single locality, I found that even the Siberian and Duchess were not carrying the usual quantity of fruit, and numbers of trees that bore well in 1886 had scarcely a specimen in 1887.

IN WISCONSIN.

On the twentieth and twenty-first of July I visited the Russian orchards of A. J. Tuttle, and others, at Baraboo, Wis. There I found the Duchess, Tetofsky, and about twenty of the newer varieties of Russians, fruiting quite liberally. Mr. Tuttle's orchard of new Russians contains over sixty varieties, and about half of them appear to be as hardy as the Duchess, about the same proportion of them are strong, thrifty growers, and comparatively free from blight. Blight was prevailing to an unusual extent in that vicinity, and the Duchess and Tetofsky were suffering about as badly as I had ever seen the Siberians, and Mr. Tuttle's old orchard of the hardiest American variety was about ruined by it. There was, however, but very little

it in the orchard set exclusively to the new Russians, and that was confined chiefly to varieties of the Alexander type. The following varieties were well loaded with fruit, and impressed me as being the most valuable: Hibernial, Glass Green, Juicy White, Red Wine, Garden Apple, Blue and Yellow Anis, Charlententhaler, Early Champagne, Yellow Transparent, Trees of Lord's Apple, and Repka, Beaul Arcad, Raspberry, Summer Lowland, and some others, were fine trees, but were bearing poorly.

The Hibernial is perhaps the best tree of all, a free and regular bearer of large, fair fruit. The season is late autumn and early winter, use, cooking, and for that purpose it is excellent. The Red Wine is a splendid tree, fruit medium, very beautiful, but quite acid; season rather earlier than Duchess. Glass Green resembles the Duchess in color, and fruit not quite as acid. The Garden Apple is sweet, or nearly so, and apparently a very hardy tree; season early autumn. The trees of Early Champagne were bearing to their fullest capacity. Mr. Tuttle informs me they are annual bearers. The trees appear hardy on his grounds. If it should prove adapted to Minnesota it will become our most popular summer fruit. In size it is below medium, quality very good, is as productive as any of the crabs, and it ripens up gradually, so that it is in season from July to September.

In an orchard near by we saw trees of the Antonovka in full bearing, and apparently sound. These trees are among the best growers of the Russians. The fruit was larger than we expected to see it at this season of the year. Prof. Budd speaks of it as the king apple of Central Russia, and a good keeper. We trust that it will be widely planted in this State. The varieties of the Anis family are doubtless hardy, and the fruit of the Yellow Anis, the only variety we have sampled (and which, by the way, was not a yellow apple), is of prime quality. Season same as the Wealthy.

We here saw the Lucretia dewberry in bearing, and we were much pleased with it.

IN NOBLES COUNTY.

On the 27th and 28th of July A. W. Sias and myself made a visit to the orchard and gardens of H. J. Ludlow, at Worthington, and we were agreeably surprised to find there the most fruitful orchard we had seen in the State this season.

We found this thrifty young orchard looking fully as well as when we visited it last year, and fruiting to its fullest capacity, and never in any locality have we seen the Tetofsky doing so well. The bear-

ing varieties are chiefly Duchess, Tetofsky, Wealthy, and some other hardy varieties and Siberians and their hybrids. We estimate the crop at two hundred and fifty bushels of the larger apples, and as many Siberians. The orchard is situated about thirty rods from the shore of Lake Okabena, and is protected on the west by a willow break, about two hundred feet distant. A windbreak near that to an orchard would prove disastrous, owing to the tendency of the snows to lodge inside of it in huge drifts.

Our objective point was the Okabena seedling tree, upon which was reported at the last winter's meeting. The tree passed through the winter without any perceptible injury, and was now carrying a fine crop of most beautiful fruit. It has not been tested elsewhere, but it proves as hardy in other localities as here, and has the constant tendency to resist blight, it will prove of immense value to the Northwest.

We discovered another seedling in this orchard having the same origin, which seems to be equally as hardy as the Okabena. It is believed to be a longer keeper. The fruit is just the right size for the desert and retailing, beautiful as a coy maiden, and of excellent quality, an agreeable sub-acid. These trees are true Minnesota seedlings, and probably seedlings of the Duchess and Wealthy, more beautiful in appearance and better in quality than either; are they not the "rainbow of promise" for the future of apple culture in this State? Will they not encourage us to save the seeds of the hardiest and best fruit raised in our own State, plant and raise trees, saving our best, continuing to do so until we have reached the climax of our proudest hopes?

These fruits were afterward shown at the Southern Minnesota State Fairs, and greatly admired by all who saw them; and the Wealthy tree was awarded the first prize over the Wealthy as being the best seedling apple grown in the State, and very appropriately named "Daisy."

IN COTTONWOOD COUNTY.

We made our next stop at Mountain Lake. The people here are largely Russian Mennonites, and there is an air of neatness and thrift about their homes that we seldom see in a newly settled country. Thrifty groves and rows of forest trees surround the dwellings, and they are given thorough cultivation and kept as neat as the best public gardens. These people are great lovers of fruit, and several of them brought with them from their native country seeds and trees, of apple, pear, plum and cherry. Thus far they

met with much success, and it is not to be wondered at, as many of them came from a portion of Russia where the climate is similar to Southern Iowa and Nebraska.

The cherry trees have fruited, and are said to be hardy and fine; one of the seedling pears and plums look promising. The deep snow last winter was very disastrous for them. Snow drifts formed beside the shelter belts to a depth of ten to fifteen feet, and as it set away in the spring crushed the trees to the ground or denuded them of their branches. Otherwise, I think we should have been rewarded with the sight of some fruit.

Important lessons can be learned here in regard to windbreaks and shelter belts. Evidently the outer rows should be placed two hundred feet or more from the orchard, and if more shelter is needed a low belt of mulberry, or some other shrub, might be set say sixty feet outside the fruit trees.

Some attention is being given to the cultivation of grapes, and two hundred bearing vines seen on the place of Peter Goertz convince us that they may be successfully grown here when properly managed.

Our next stop was at the place of Dewain Cook, about fourteen miles northwest of Windom, the object being to examine his hardy mulberry. It is evidently a variety of *Rubus Canadensis*, and appears to be more shrubby and less trailing than the varieties found native to the eastern part of the State, or the Lucretia or the Bartlett. It may be identical with a variety that in former years was found growing at St. Anthony.

With Mr. Cook this plant is enormously productive, and a large portion of the berries are perfectly filled, which would indicate that it is a strong staminate; it may prove valuable for fertilizing the Bartlett and other shy fruited. We found the fruit about the size of Stone's hardy blackberry, but Mr. Cook is growing them without any thinning or pruning, and the fruit would probably be much larger if greater pains were taken with the pruning and cultivation. The quality of the fruit is very good. They are growing upon a deep, rich, prairie soil, and if they succeed as well in other localities and soils will prove a most valuable addition to our list of small fruits for farmers. We have taken steps to have them tested in other localities, and expect that another season we shall know more about them.

Mr. Cook has a great variety of trees and plants on trial, and we shall watch the result of his experiments with great interest. With a few such men in every county in the State our perplexing fruit question would soon be settled.

On returning to Windom we stopped for an hour at the place Wood, distant about four or five miles from the above named place. He is quite enthusiastic on the fruit question, and showed us some promising seedling varieties of raspberries, gooseberries and grapes of his own raising; also a tree of the Russian mulberry bearing fruit as large as the Ancient Briton blackberry.

We noticed that forestry plantations and windbreaks are receiving considerable attention among the Mennonites in this county. As other parties who design to make this their permanent home are doing fairly well, making a good season's growth, except in some instances where they have received serious damage from insects.

The willow worm and cottonwood tree beetle are increasing to an alarming extent, and it does seem that if our legislature felt an interest in the future welfare of the people of this State they would take some steps towards making investigations in this matter. Our committee suggest that our Society petition the Department of Agriculture at Washington to give this matter their early attention.

IN RICE COUNTY.

On the fourteenth of October Mr. Sias and myself paid a visit to the Peerless apple tree, standing on the farm of J. G. Miller, of Rice county, about eleven miles southeast of Faribault. We learn that the tree is seventeen years old, and was raised from seed of the Duchess of Oldenburgh, saved from fruit raised upon a farm about one mile west of where the tree now stands. In the orchard from which the seed was taken there was growing in proximity to the Duchess, but no trees of the Golden Russet and Talman Sweet. The Peerless was found to be the hardiest and best of a batch of seedlings raised by Mr. Miller, eight of which fruited and specimens of the fruit were exhibited at the State Fair about ten years since. I remember at that time I was favorably impressed with the appearance of these seedlings, and pronounced most of them of a quality superior to the Duchess. I thought some of them would prove better keepers. There are now but three of these seedling trees left. Two of them do not appear to be as hardy as the Peerless, and are but little if any better in quality now or later in season, than the Duchess.

The Peerless has successfully endured three of the most trying winters known in Minnesota, and is still in very good condition, but perhaps not quite up to the Duchess of the same age, although a much larger tree. It has lived to see two generations of what are termed "Iron Clads," including the Wealthy, totally annihilated, and

Fuller says has been the most profitable tree in his orchard. It is a vigorous, medium, upright grower; the trunk is about ten inches in diameter; it is about four feet from the ground to the first branches. It is growing upon the north side of a belt of willows, but much too close to them for the best results.

Mr. Fuller has had about one hundred and fifty trees of different varieties in his orchard, all of which have killed out except the Duchess, a few varieties of Siberians and these seedlings. This tree was not fruiting this year. In size it is about like the Duchess, and the season is said to be from December to March. He has quite a number of young trees raised from seed of the Peerless, several of which look very promising. He also has several trees from seed of Transcendent which are free from blight, and one of them is the most beautiful and hardy looking tree we ever saw. The fruit is larger than the Transcendent, keeps a month later, and is said to be of better quality.

We left his place chanting to ourselves the old song so often sung to the late and venerable Marshall P. Wilder—

“ Plant the best seeds of all your best fruit,
 Good fruits to raise that some lands may suit;
 Fruits which shall live, their blessings to shed
 On millions of souls when you are dead.
 Plant, plant your best seeds, no longer doubt
 The beautiful fruits you may create;
 Fruit which, perhaps, your name may enshrine
 In emblems of beauty and life to shine.”

We have learned of some other seedlings of promise, but the information came too late to pay them a visit. One is at or near Kasota, Dodge county. It is reported to be a seedling from the Duchess, now twelve to fifteen years old, having thus far withstood the winter better than the Duchess. The fruit is about the size of an orange, good color and flavor; season about January. We understand it is on exhibition at the Southern Minnesota Fair, and trust that Mr. Fuller will give us a further report on its merits.

The seedling of Jacob Kline, of Houston county, is reported as still healthy, and having produced a liberal crop of fruit during the past season.

It is reported that R. D. Frost, of Madison, Wis., has a seedling which bore twenty-five bushels of apples in 1886, and that scions could be procured of him for testing at our experimental stations.

The Cheney plum, a native variety found in Vernon county, Wis.,

is gaining in favor. It is early, productive, and larger than the Soto. I have the promise of scions for the use of our experimental stations.

So far as the behavior of the newer Russians is concerned in the State, we have been able to add but little to our previous knowledge.

We had hoped to get some valuable points from the Russians in the orchard and nursery upon the State Experimental Farm. We did go there to see them dug, and to give each number a careful and thorough examination, and to take copious notes of their behavior in the nursery trees, the character of the foliage, etc., but were unfortunately in finding Prof. Porter absent from home. All of which is respectfully submitted.

REPORT ON SEEDLING FRUITS.

By A. W. Sias, Rochester.

Your committee are not content, in the second year of their office, to add nothing interesting or valuable to their report. Our year was of necessity spent in reconnoitering the extensive field before us, and all that we had time and means to do was to report on what we considered to be the most worthy trees and fruits. They have failed to find all the best varieties in the great field before us more than likely. We advertised through the press for all those bringing choice new fruits to inform us that we might examine and report upon them. But very little attention has been given to this, and that accounts in a measure for the brevity and lack of information of the present report.

The first thing, perhaps, worthy of note for our report was the summer meeting of the Olmsted County Horticultural Society held June 11th, where the first exhibit of the famous Jessie berry was made to a Minnesota audience. These berries were such that they were eaten as you eat large apples, by biting off the top first. Some of the far-seeing ones present said they would take them home and plant the seeds from them. Your committee saw at a glance that that was the most sensible speech made during the session. And after they had all finished their bountiful feast and taken their leave, they pleased to plant, your reporter carefully gathered up the seeds, and the result was in the fall he was able to show, and exhibit to T. T. Lyon, of Michigan, and other noted horticulturists, some five hundred plants of little baby Jessies as fine as F.W.

any other expert would care to look upon. We mention this not in a raggadocio spirit, but rather as an example of what others should do for the improvement of our best fruits. I say best because Mr. Loudon has fairly demonstrated the truth of what A. J. Downing uttered over forty years ago, viz: "Once in the possession of a variety which has moved out of the natural into a more domesticated form, we have in our hands the best material for the improving process, the fixed original habit of the species is broken in upon, and this variety which we have created, has always afterward some tendencies to make further departure from the original form."

Mr. Loudon took the Sharpless, and some others of the largest and finest known varieties and crossed them. The result has been the largest and finest berries known to civilized man.

IN BLUE EARTH COUNTY.

July 28th, in company with Mr. Harris, we left Rochester for various points in the southwestern part of the State. Our first regular visit was Mankato, a flourishing town on the Minnesota river. We have been wondering for years why Mankato made so little noise in the horticultural world, and we are reminded again that "still waters run deep." Nature has done her part, in my humble opinion, to make Mankato the garden of the State for all horticultural products so well adapted to any part of her large domain. My acquaintance with Mankato's horticulturists is extremely limited, but that there is heaven here that will soon ferment the whole mass, I am quite hopeful.

J. H. Vandervort writes Jan. 9, 1888: "Horticulturists of Minnesota, who have so many difficulties to overcome, will find that there is strength both in union and communion." The Mankato people will yet discover the wisdom in this remark from one of her leading horticulturists, and organize a local society there that will cause other parts of the State to look well to their laurels.

IN NOBLES COUNTY.

Mr. Harris will no doubt tell you of the many good things we saw at Mankato, so I will pass on to Worthington, a beautiful prairie town near Lake Okabena. Our principal object here was to inspect the choice seedlings of J. H. Ludlow. He has here one of the best bearing orchards in the State. We found Mr. Ludlow hauling off apples to market by the wagon load, and we estimated that there was well over two hundred bushels on the trees. I was astonished, and

immediately donned my thinking cap and inquired if we had been traveling east for the last day or two? When answered in the affirmative, I exclaimed: "But I was told that apple trees would not grow *apples* as far to the westward as this: how is it?" I refer you to Ludlow.

Will leave the particulars of this pleasant visit with Mr. [redacted] who gave you such an accurate account of the situation in our annual report. Will say, however, that Mr Ludlow's seedlings, The Okabena, Daisy and Wax, surpassed my anticipations. They were all exhibited at our fair at Rochester last September, and won the first prize as the best collection of seedlings. How these seedlings will behave when removed north from the south border of the State, and from Lake Okabena, this deponent saith not, but they are well worthy of trial.

It is not improbable, we think, that the Daisy should prove the most valuable; it is the best keeper, and carried the most fruit in the present season.

IN COTTONWOOD COUNTY.

Windom was our next objective point. Here Mr. Dewar met us and piloted us out some fourteen miles across the prairie to his well cultivated little farm, where flourishes in lavish abundance the Cook's Hardy Dewberry, which, I think, he prefers to designate the "Windom Dewberry." How this plant will succeed on the clay soil, or timber land, we cannot say; but for the prairies, compared to that of Mr. Cook's, I very much doubt if it has an equal quality. I must say that it fitted my mouth so nicely that it became too full for criticism. At the time Mr. Cook brought the dewberry into notice, many planters had become discouraged in regard to blackberry culture, but it does appear as though the most prolifically productive variety must go a long way towards restoring confidence again.

Mr. Cook introduced us to some of the leading gardeners among the Mennonites and we endeavored to glean something new and valuable, if possible, in regard to the much talked of mulberry, and other plants peculiar to the Mennonites. We came to the conclusion to buy Russian mulberry plants there, even at the low price of one hundred (as we had done several years ago), would be a waste of money, as it would be like a man's buying common seedling stocks for an orchard, as he would not stand a ghost of a chance to get a single tree of good repute. We found one man there v

had a mulberry among his seedlings that was of good size and quality. The tree looked hardy, and he had it layered, and promised us a cut from it, which we expect to receive next spring. In this way, careful selections from thousands of bearing trees, and then plant-seeds from these again, in time we shall no doubt produce a large, fine mulberry, like the Downing Ever-bearing. We found some of the Mennonites well up in grape culture, small fruits and vegetables.

IN DODGE COUNTY.

Next visited C. H. Pond and Alexander Houston, of Kasson, Dodge County. Mr. Houston has a seedling of the Duchess some fourteen years old. The seed was planted by Charles Gove, a former owner of the farm. The fruit is thought to be superior to the Duchess in quality and a better keeper; cannot say just how long it will keep. Mr. C. H. Pond, if not the principal fruit grower in Dodge county, is fast learning that way. He has a native plum grove that produces a large amount of very fine fruit, perhaps fully up to the De Soto, Rolling Green, and other cultivated varieties.

IN RICE COUNTY.

October 14th we visit the Peerless apple tree in Rice county. We called on O. F. Brand, to have him show us the way, but he was out of town, and we had to find our way the best we could. J. G. Miller, the owner of the tree, gave us the following history of the Peerless: "Seedling of the Duchess; age, seventeen or eighteen years; has been transplanted once; stands on a common clay soil, in a row of willows on each side; its season is from about the first of November to the first of January." Mr. Brand has got all the fruit so far. It has borne eight or ten bushels in one season, and the average about four to six bushels a year. We found other promising seedlings in this orchard, and Mr. Miller is to be congratulated for his success in growing seedlings. But I will not weary you further, as the chairman will doubtless give you a detailed report of the many good things found at J. G. Miller's.

REPORT ON SEEDLING FRUITS.

By G. W. Fuller, Litchfield.

I have visited the two seedlings referred to in my report that of Mr. Mills in Greenleaf, and of Mr. Baldwin in Cedar. The trees bore but little fruit. Two apples from the Mills kept in my cellar until a few days since. The Mills seedling keep but a short time.

I put in grafts from both these trees last spring, and, after a year, shall be able to say more certainly what they will do.

I am inclined to think we cannot decide on the real value of the seedling, until we have tried it by growing grafts.

I have had no opportunity to act with the other members of the committee.

G. W. F.

LITCHFIELD, Jan. 17, 1888.

DISCUSSION.

Mr. Dartt. I would like to inquire of Mr. Sias on which side he found the windbreak; when visiting the Peerless?

Mr. Sias. I noticed when visiting the tree that the orchard was protected from all sides.

Mr. Brand. Mr. President, I want to correct one or two errors in the description of the Peerless apple. In reference to the age of the tree, your committee took some facts from Mr. Miller's memory. I have something more substantial than that. In 1875 I made a map of the orchard and a record of it, and numbered every tree. At that time, as he told me, the trees were six years old past, and in my opinion they were a year older still; he stated that they were from seeds of apples raised in 1867, as that was the year of the large crop of apples, in another orchard, which I found confirmed by reference to the files of the *Faribault Republican*. He got the Peerless from that orchard.

With reference to the condition of the tree as compared with the Duchess, I would state that in the year 1888 I sold Mr. Miller thirty Duchess trees, nearly all of which came into bearing, but have all killed out except four or five which still remain of the original thirty set in the spring of 1869. He has planted a good many since, but the Peerless has produced twice as much fruit

ness of the same age, and its last crops have been its largest ones. Last crop it bore was between ten and eleven bushels, and the year before in 1884 was nine bushels. The Wealthys in the orchard have all borne well out. I simply made these remarks because I made a statement at the meeting in winter which did not appear in the record.

Mr. D. A. Robertson, of St. Paul, was here introduced as the first president of the Society, he was asked to come forward, at the same time being greeted with applause.

Mr. Sias. Just a word in regard to the age of the Peerless apple. I have no doubt Mr. Brand is correct about its age. I have Duchesses on my place that are twenty-three years old, and this Peerless is still larger than any of mine. In regard to the discrepancy in amount of fruit produced, I don't pretend to know about that.

Mr. Stevens. Mr. President, I would like to know if this tree is propagated generally, and has there been any fruit raised from it by grafting?

Mr. Brand. No, sir; I don't think there was any scions taken from the tree until a year ago last fall; there will be no chance for its being fruited for a couple of years yet. Another point I wished to mention: Mr. Harris states in his report that there are only three of the seedlings left in the orchard; there are six left. I got fruit from five of them a year ago last fall.

Mr. Robertson here took the floor and stated that one of the most interesting topics to him was that of the feasibility of growing apples on forestry trees, their effect upon the amelioration of the climate, etc., etc. When the Duchess was mentioned he was interested to know where it was grown and where it was grafted. He knew nothing of the Peerless. It was only by accident he had learned of the meeting, as he had supposed from a notice in the paper that the meeting had been postponed.

President Elliot said the notice had reference to the meeting of the Society here.

Continuing, Col. Robertson said that as soon as he discovered his mistake he hastened to come to this meeting, as he had certainly intended to be present; there was no organization in the State of Minnesota comparable to his brain and heart than that of the State Horticultural Society, on account of the good it could accomplish for the State and Northwest. He had always attended its meetings when possible to do so. He inquired as to the origin of the Peerless, as he knew nothing of the variety.

President Elliot. That is a new seedling just being brought out.

Mr. Brand. It is a seedling of the Duchess, and is supposed to be a cross from the Talman Sweet.

Col. Robertson inquired as to the exposure of those trees which had been destroyed.

Mr. Brand said he would make a plat of the orchard, if desired. The north side of the orchard was a row of willows and some other wood trees, not more than two or three rows on the north.

Col. Robertson said that would be insufficient for protection. He had tried experiments with seedlings for many years; a good many years ago he had his experimental grounds near the city, but he had expended much money uselessly, perhaps, but he hoped to have found a sheltered spot, but a severe winter killed the seedling trees; others had tried to raise seedlings with little experience.

He said that a Mr. Stewart, of Le Sueur county, had planted a few trees, perhaps, but not of great value. He had investigated where seeds came from, and in most instances found that they were from cider apples. He had been informed by an eastern seedsman that his stock came from apples grown in New York, Pennsylvania and Virginia; and when he saw the trees, the statement was confirmed. In those states the best apples were used for cider, and the worthless ones used for cider, hence the worthless seeds. The old varieties of apples grown in New England were mostly seedlings. The Newtown Pippin originated at Flushing Island. He had often visited the celebrated gardens and orchards in that vicinity, when a boy; he came to Ohio in 1838. He found the country there full of worthless seedlings, but a lot of good varieties. He went through the state with their bundles of scions and soon transplanted them to the orchards. In this way the Ohio farmers got their fine varieties. He knew of one man who went through the country, and could grow a dozen varieties from one tree, and it was no wonder for it could easily be done.

Many men who could afford the expense had imported trees from England, and some from Germany, and by making judicious selections, varieties of fine quality and flavor had been introduced.

Apple seeds obtained from the cider press were unfit to be planted. He had heard nurserymen say that the root did not like the stock, but he could prove to the contrary. The Duchess died when exposed, as also would most other varieties. He had been in Europe for some time recently, and had been studying the causes for the losses of trees, etc., with much interest.

It could be observed that any tree that was exposed to these northern winds would die the same as persons would perish when exposed to the cold blasts. The winds that prevail in the winter throughout Canada, and south as far as Kansas, were too rigorous to be endured without some protection against them. He knew something about it, as he had slept out of doors on the prairie when the thermometer was 25° below zero; it was pretty hard to keep warm, even with fires. There was a great difference to be observed in the atmosphere where there was protection from forests. He had talked with ex-Gov. Marshall, for one, who was surveying for the Government some forty years ago, and who had others camped out in tents in winter in the woods, in Wisconsin and Northern Minnesota, while surveying. They managed to live without freezing; out on the prairies they would have frozen to death. It came in as sort of an episode.

Where the barriers to orchards are removed there is a decrease in the amount of fruit produced. He had noticed this fact at Vladivostok, Russia, and the same thing is referred to in the reports of Prof. Hillebrand and Mr. Gibb, who had visited that country. What was needed for the orchard was protection. The best protection, in his judgment, was that of evergreen trees and hedges.

Col. Robertson said he feared he was taking up the time of others, but he felt great interest in these matters, as he had studied them very thoroughly. He had noticed that the Duchess was inclined to split on the graft, and recommended planting a large stone under the tree, which would cause the tree to throw out roots of its own. The same rule would hold good with other trees too tender for the climate.

He said there was no reason why people should become discouraged in raising fruit. They were raising apples in abundance in Russia, and had the very finest kinds of winter varieties there, and he had gone to pains to obtain some of the seeds which he had brought home with him. There were finer varieties to be had than we had yet seen here.

The Duchess, according to his investigations, was a Swedish variety. It had been taken thence to Germany and England. He had traced up its origin with a good deal of interest and patient research. He had found this to be true, that in every country on the face of the earth there were seeds to be found which would produce the variety of plants that were best adapted to the particular region of country, and as would prove of the highest degree of excellence, and adapted to the climate of the particular country where the seeds originated.

From seedlings, and nothing else, good fruits were to be produced. The same law held good with the ancients, but the Greeks understood the process better than the Romans, as he could show by references in books in his possession.

At a convention held in England some two years ago an effort was made to obtain information with regard to the adaptation of different varieties of apples to the different parts of the British Isles. There he demonstrated that every locality had a different climate, and that different varieties were adapted to particular regions of the country. He believed that animals were climatic, and plants as well; even the food that grew on God's earth was climatic, and it was wonderful that it should be so, although we could not tell the reason.

He had heard of a delegate to a certain political convention who asked the question, "What are we here for?" That might be asked of us individually. We are here to take care of ourselves, and here to subdue, replenish and beautify the earth.

Mr. Thompson. We have been talking about the Duchess of Oldenburg. I do not know of any such apple; we are misnaming it. There is no such variety in the catalogue. The name Oldenburg is correct, but the other is a mongrel. The true Oldenburg is a Russian variety, and a general favorite throughout the district where it originated, as well as throughout the Western States, as shown by this list, in which I have referred to it. I have here the historical accounts of our best varieties, and the Duchess of Oldenburg is not mentioned in the list, while the Oldenburg is. It is described as of medium size, round, oblique, yellowish red in color, quality good, seasonable, a Russian variety. It is a good apple. The tree "strong" has been added to the name. I have on my grounds the Oldenburg proper.

I have heard of agents who have been around in Grundy County, selling what is called the Winter Duchess. There is no such variety. It is what is known as the St. Lawrence, a very valuable apple. One of your agents here representing L. L. May & Co., was there and tried to humbug me into buying some of their trees. I suppose would have agreed to sell me anything under the name, and would have given me some hazel brush claimed to bear pears. I would have given him the order.

We, as horticulturists, should exchange ideas; work in harmony. There is not a man living that is too old to learn something. The interchange of ideas. The great trouble is we are apt to be

want to act as a family of brothers. We are all working to one, and should remember that in unity there is strength.

My name is Thompson. I have the champion seedling orchard of Windy county. I believe that every man can raise fruit on their farms if they will make the effort to do so, in a greater portion of Minnesota and most of Iowa. They can do this with proper protection using our native seedlings and crossing them with the choicest European varieties.

I agree with Col. Robertson that the root does affect the scion; it does affect the flavor of the fruit if allowed to remain. It is best to have a tree on its own roots if possible. I never sold a tree in my life. I don't want to interfere with the business of those who sell trees. I should sell trees true to name, and then, I say, let the purchaser use a good deal of common sense, and investigate as to the kind of tree he has, the best locations, study the reports, and plant the varieties adapted to the soil and location, and they will succeed, and not fail then. Above all things there is no use for people of Northern Minnesota and of Minnesota going to the east of the Mississippi river, taking soft, woody trees, gathered up promiscuously, to be planted out. My theory is to plant seeds of the best varieties of seedling trees, and throw away the worthless kinds. I have experimented with seedlings until I have more than a hundred distinct varieties in bearing in a single season, in a seedling orchard of a little over three hundred trees.

Col. Robertson stated that he had found from observation, where trees were improved either in Europe or in this country, it had been by the cultivation of the best varieties and by the propagation of seedlings. The experiments that are made should be conducted by agricultural institutions. The work was too expensive to be conducted by individuals. The results accomplished by our experimental stations would be more satisfactory than could be obtained in any other way.

REPORT OF COMMITTEE ON NATIVE FRUITS.

By O. M. Lord, Minnesota City.

In the production of native fruits, Southern Minnesota bears no comparison with that part of Wisconsin lying east of it, especially in fruits as have a wide commercial value, like cranberries, the va-

rious kinds of huckleberries and blackberries; and it is do we have a great amount of soil adapted to the culture of the named. The only places where our native fruits are indig among the timber, on lands lying contiguous to the stream the groves which are scattered here and there on the prairies lands are of limited extent compared with the area, but we c ably find upon them all the varieties common to Wisconsin the quantity is too small to be of great significance. Stra were found growing wild when the country was first settled, a fields were left uncultivated for a year or two they were so very abundant, and in some places still continue to be so; but tivated kinds have entirely superseded them for market, largely for home use.

One or two varieties of huckleberries are sometimes found sandy table lands along the streams, especially if the soil b of disintegrated sand rock. But they do not appear as luxur as productive in fruit as in a more congenial soil. The clim ditions can not be materially different from those in Wiscor by, where they grow in immense quantities. The habit of t under cultivation, if it has ever been carefully observed, is n ally known, and as long as the fruit continues to be furnish markets in such quantities and at such low prices, no elabora iments in their cultivation will be made.

The cranberry, as a commercial fruit, occupies a very i place. There are a few marshes along the south side of the M river, but no great attempts have been made to improve the perience has shown that under good cultivation they vary s in size and shape, but in quality and in habit of growth thei ter has not been changed from those found growing wild.

The subject of cranberry culture has occupied so promin in horticultural works that it will not be here further discuss

Blackberries are indigenous along the Mississippi bluffs, a groves of brush and timber throughout this part of the State are few localities, however, where they have grown in quanti cient for market, or where they can be relied upon to prod annually; and, indeed, it has been rare in many places v bushes grow, to find any fruit for several years past. These may also be applied to the dewberry, though the dewberry i to a greater variety of soil. It is found equally thriving on sandy soil, or heavy clay.

It is well known that these fruits have long been profitab

market, and their cultivation is said to have improved them. Though the varieties in cultivation have been selected from superior ones, or from chance seedlings of marked character, so far as I know no choice variety has originated through cultivation alone. Though they have been successfully cultivated in this vicinity for years of years, without winter protection, the last few winters have shown that they are not entirely hardy here, which also probably accounts for the disappearance of the fruit of the wild ones. Black raspberries were not found here till about the year 1864, or five years after settlement. They made their first appearance in alluvial deposits along the streams, but have now found a home along the roadside, and even in the crevices of the rocky bluffs, and on the uplands. They have repeatedly been transplanted to gardens for cultivation, but the results do not seem to justify the labor. It is found that the improved kinds are hardier, more productive, and better in quality than any that have been brought to this country selected indiscriminately from wild ones. Wild raspberry bushes are often found in the hazelnut brush, and sometimes in other localities; but they rarely fruit here in a wild state, as the tendency of all of them is to swamp themselves with runners. In a very moist land they have a little fruit, but it does not compare in size and quality to the varieties commonly cultivated. Gooseberries, both rough and smooth, and black currants are quite common in the moist sandy soils near the streams, and here also is found the wild grape, often in great abundance. These are gathered in considerable quantities nearly every season and used in domestic fruit making. Highbush cranberries, the black haw, the thorn apple and wild rose apple are also found in similar locations. The fruits of all these are sometimes utilized, but no attempts have been made to improve them. The trees or bushes have been transplanted for ornament, or out of curiosity, and they often thrive and appear to do well, and may be made to serve some useful purpose. We also have the Juneberry, the choke cherry, and a dwarf black cherry, mostly found on the soil of the valleys. The sand cherry is only found on the gravelly prairies formed by the Mississippi river. If there should prove to be an important truth in top grafting hardy species, to secure the production of fruit in this climate, the sand cherry may yet be found very valuable.

All of these are altogether food for the birds. Though the berry is quite palatable it is rarely tasted, as it ripens at a time when the birds can find little else so desirable. It has been cultivated to some extent further south, and the plants offered for sale, but the birds are too destructive to make the fruit profitable.

Wild plums are quite common in the vicinity of timber, in brush, and along the margins of the smaller streams, or where they are protected from fire. The tree is entirely hardy, natural when cultivated, and flourishes in a great variety of soils, and bears fruit more abundantly than any other tree, and at the present time horticultural work is attracting attention second only to that among the larger fruits. In the short time in which it has been brought to notice, it has been demonstrated that it can be hybridized or cross fertilized to an unlimited extent, and we have reason to expect as much advance in its culture as has been made in straw

The following report was presented by Mr. Harris:

REPORT ON FRUIT BLOSSOMS.

By J. S. Harris.

Mr. President I find myself in a novel position as a member of the committee on fruit blossoms. I can see beauty in the flow of utility in the fruit which follows, but I am not well versed in scientific botany; moreover, I do not not know what you are expecting of me.

By referring to notes taken at the time, I find that on April 1st the toads were out of their winter quarters, and blossom buds of cherry and plum were nearly open.

May 2. Cherry and plum trees in full bloom, and the buds of the rollingstone quite prominent. The stamens on the cherry are well developed and filled with pollen. Weather warm and windy.

May 3. Morning almost cold enough for frost. Juneberry in full bloom.

May 6. The petals of the flowers of the cherry and plum are all dropped. The rollingstone is in full bloom. DeSoto and other plums are commencing to open their blossoms. Weather quite warm again.

May 7. Pleasant, dry and very warm. Transcendent crabapples are commencing to open their blossom buds.

May 8. Clear and warm with strong winds. Transcendent crabs in full bloom. Duchess and Tetofsky are showing considerable fruit. The blossom or petals have all fallen from the plum trees; also from the Juneberry.

May 10. Ground so dry we can scarcely plow. Duchess, Wealthy, Tetofsky trees in full bloom and petals falling from the Transcendents.

May 13. Warm to hot. The bloom has entirely disappeared from our fruit trees. It seems to us that we have never known one to hold their blossoms for so short a time. During the season of blooming the weather has averaged warm, the ground has been dry. We have had considerable wind and not very much dew.

May 15. Blackberries are commencing to blossom.

May 17. Blackberries in full bloom.

May 19. Black raspberries commencing to bloom.

May 26. Concord grapes in bloom.

RESULTS.

Fruit of all kinds appeared to set as well as usual, at least it commenced to grow and enlarge. In a few days the principal part of the crop had dropped to the ground, and none held on to mature except a few of the DeSoto. The young apples commenced to drop immediately, and continued to do so up to the twentieth of June; by that time the Wealthys were literally all gone; Duchess, with the exception of a single tree, but a few left. A portion of the Transcendents dropped about as bad, while a few trees produced a half crop. Tetofsky, Strawberry crab, Pride of Minneapolis and Montreal Beauty, matured full crops.

The raspberry and blackberry crop would have been good but for drouth. Grapes were a large and good crop.

Query. Was the loss of the plum crop and the shortness of the apple crop caused by drouth or a failure of the blossoms to fertilize from imperfect reception of pollen on account of strong winds and dry atmosphere? I think the latter. Why? First, in the town of Greenfield, Wis., two neighbors have a quantity of the cherry plum; in one case they are on sandy ground and exposed to the winds and the crop failed; in the other case they are on a moist, loamy soil and sheltered from all but southeast winds, and they matured a large quantity of good fruit.

In my place the DeSoto, the only variety that matured fruit, were sheltered by other taller trees. The other varieties were exposed on all

sides. The most apples were produced on trees the best shes believe there is much truth in the old saying that when the hold long there will be much fruit.

J. S. HARRIS,
Chairman of Commi
La Crescent,

REPORT ON RUSSIAN APPLES.

By A. W. Sias, Rochester.

Mr. President, and Gentlemen :

We are getting more large, fine fruit at the present time nesota from trees of Russian origin than from all others. I find fault with the "bridge that takes us safely over the s The silver leaved family that I mentioned in my report a year which the Autumn Streaked is supposed to be at the he through the severe drouth last summer without flinching, or leaf. Mr. Peterson agrees with me that the Red Cheeked the hardiest known sorts, and unsurpassed as to color, but bearing qualities I am not so well advised, as I have but one that on the Hyslop stock. With me it has never borne well; in grass and cares for itself. The Anis family still bids de drouth or winter's cold. The Russian Green, Hibernial, Lie Little Turnip Apple, White Pigeon, Antonovka, Titovka mother, Enormous, Green, Yellow and White Transparent, a others are still with us, and unless we get a temperature low 50° below zero, they are likely to be for a long time to cor about the height of my ambition at present is to obtain a tween the strong constitution of the Autumn Streaked, with fect foliage and fine quality of pulp, and some other Russian keeping qualities, red color and large size, like the Red Blac a cross with such an almost perfectly hardy variety as Cheeked with the McMahon White, which I believe to be Golden Russet and balance Russian. That there is money in of work I steadfastly believe.

REPORT ON RUSSIAN APPLES.

By Andrew Peterson.

never had so much damage to my apple trees as I had last winter. I think the cause was first that we had no frost in the ground before snow came, and next that my orchard is sloping to the south, so that when we had sunny days the sap was up pretty quick, and then in evening it became very cold with a sharp wind before the sap set down, causing injury to the trees.

My Wealthy trees, from three to six year old, were killed to the snow line, and in the spring were entirely dead. The same effects were seen with the Duchess, but not so bad.

As to my Russians, I find the Charlamoff was injured by sun-scald as much as the Duchess, but the Hibernial and Ostrekoff's were out all right, and they are hardy enough for Minnesota always. No. 980, Pelikanoff, is a hardy tree with better fruit than I thought, a scant bearer. No. 445, Romianka, is the hardiest of all the Russians, or any crab variety, but a poor bearer. I think the reason that the tree is standing in the nursery now, with a long tap root. Christmas apple and Winter Livland and Sweet Borovinka are hardier than the Duchess of Oldenburg.

The Russians that I received from Prof. Budd are No. 10 Riga Stripe, No. 22 M. Blushed Calville, No. 387 Good Peasent, Antonovka, Red, No. 382 Peter-hoff, No. 169 Green Sweeting, No. 4 M. Ostrosky; not the same kind as from the Department. All these varieties did not sustain any damage at all, and they seem to be hardy enough for Minnesota.

The next are those that were sun-scalded more or less, but not damaged in the top: No. 208 Czar's Thorn, 252 Aport, No. 14 M. Lim, 220 Tilus Risur, No. 200 Rosy Repka, 502 Rambour Reine. No. 3 M. Lead apple, No. 28 M. Kluevskoe, 2 M. Hare Pipka, 169 Grandmother, but none of these I think will be hardy enough for Minnesota, anyhow but No. 2 M. and Aport.

And now as to these that are not hardy enough for Minnesota: No. 1000 Marbooka, No. 53 Vincent, No. 1277 Voronesh Red, No. 210 Vineyard, No. 413 Cross apple, No. 20 M. Kursk Reinette, No. 5 M. Royalta. These above named I think are all too tender.

Angfield, Suso winter, No. 53 M. No. 9 M. and Zelenka are entirely

The Russian pear trees were killed to the snow line, except one variety is living yet, but richly it promises to blossom next spring. The

Russian plums standing on the south slope were killed entire those protected by the woods are all right.

Four years ago I imported sixty varieties from Sweden first and second years some of them came out all right. Last most of them were killed down to the snow line, except one and that is just as hardy as any Russian, and as it is a long k Sweden, I think a good deal of this tree.

As to other fruits I would report that last winter was a ve one, and we did not have much fruit this last summer. The ries had a good deal of damage and very little fruit; the Turn out all right and fruited well.

In Carver county there was no fruit last summer except so apples. Grapes bore well last summer at my place.

I have more of the Russian varieties that I have not mention but they are too young yet so I can't say anything about them

WACONIA, Minn., Dec. 21, 1887.

FORCING HOUSES.

By J. S. Gray, Minneapolis.

Mr. President and Members of the Minnesota State Hort Society:

I enter upon this essay reluctantly, knowing that there are ber of men in and out of this Society whose experience is muc than my own; but since those of large experience prefer to k knowledge to themselves, I, who claim to know but little, an to share that little with those who know still less.

Wishing to grow such vegetables as lettuce and radishes fo and spring trade, our land being nearly level, we decide upon our houses north and south, and while we concede that the west built house, with a one-slant roof to the south has the a of a more direct sunlight in mid-winter, and therefore warme time, we claim for the north and south house, span roof equable temperature; the early morning sun in early spring months strikes full upon the glass; at noon it strikes upon and obliquely on the rafters, making a partial shade; this s creases as the sun moves westerly, until due west is reached, again strikes full upon the glass on the west side of the house

STRUCTION: Cedar posts squared are set in the ground two feet

four feet apart in line for the side wall; another row ten feet six inches distant for the other wall, and also posts for the end wall; the outside walls are then boarded up with common rough boards; posts sawed off at an angle in line with the ridge; tarred paper is then laid over the walls inside and outside; the walls are then boarded inside and outside with matched boards; a cap is then nailed on top of the walls on which the top or the rafters rest, the upper end of the rafters being nailed to a 2x4 inch ridge pole, the distance apart determined by the width of glass used.

The first two houses we built we used 10x12 single-strength glass, rafters ten inches apart. On the remainder we used double-strength glass, at a cost of about thirty per cent more; rafters one foot apart, and would not use single-strength glass on such buildings at any price.

Now comes a coat of paint over everything, and then the glazing. Lap the glass not more than one-fourth inch; if a large lap is made water will get between the panes, freeze, and burst the glass. We use six-ounce tinned tacks to keep the panes from slipping down, and fasten the lights down with glazier's points, driven in with a point driver, a little machine that will drive points as fast as the hand can move from one position to another.

For filling the crevices between the panes and rafters we use a composition made of one equal part, by measure, of putty, raw linseed oil and white lead, well mixed and strained, and applied with a rubber bulb, made especially for the purpose.

The inside construction consists of a bench four feet wide on each side, with a two foot walk down the center. The benches must not be built tight to the walls, but a space of at least one inch left between the wall and bench for the heat to pass up, this part of these houses being the most vulnerable to cold. Ten foot houses heated by steam for the growing of lettuce, require a coil of these one inch pipes to each four foot bench. Four one inch pipes to each bench will give sufficient heat for cucumbers.

HEATING.

The best position in which to place the pipes is not settled; years ago it was thought that bottom heat was decidedly the best, but time brings new ideas, and one of these new ideas is that natural heat, meaning sun heat, comes from above; also that experience in forcing houses teaches us that our weakest places in these houses is in our roofs just as soon as the sun goes down. For the purpose, then, of

warming the upper air, we run our main heating pipe the whole of the house, hung to the ridge pole, then back in smaller pipes either hung to the wall or under the benches.

Those of you who have read Peter Henderson's plan of building these houses with straw roofs, with no space between, if you take my advice will not follow his example.

We have four houses running north and south, from 10 to 20 feet wide, with a space of 3 feet between the walls, and one 20-foot wide house, with 6-foot space.

After a snow storm we scrape the snow off the roofs into the alleys; in the narrow alleys we remove the snow and ice by hand; in the wide alleys we clean out with a horse and scraper.

The cost of such buildings is about \$5 per running foot for the 10-foot houses, and \$8 per foot for the 20-foot wide house, the cost of the wide house being just double the narrow ones.

MANAGEMENT.

On the benches we place about six inches of soil well mixed and finely raked and marked off in rows with a stick, through which we drive nails at the required distance apart, so that the lettuce plants will stand six inches apart from each other; in four or five weeks the crop will be ready for market; the ground is then dug over and covered with a quart of Minnesota Fertilizer Company blood and bones raked over two hundred and forty square feet of ground, and another crop is raised. Under the benches the ground can be used for growing radishes and beets and turnips for greens.

The growing of cucumbers in early spring will require a smaller house than for growing lettuce, and the vines should be hung to the rafters eight or ten inches from the glass, and will require to be fertilized by hand.

The modes of heating, viz: by brick flue, hot water, or steam, all have their advocates. A neighbor of mine, Mr. C. A. Smith, who is actively engaged in floriculture, has tried all, and is firmly convinced that steam is the most economical.

Peter Henderson has tried all, and says he would not tear down his hot water apparatus, but in all new buildings puts in steam. My opinion is that a combination of the two will prove best, using steam in winter, and for spring and fall, hot water.

The fuel needed for heating our six houses ran about two tons a week of coal during December, and as high as three tons per week during the late cold spell, or say an average of two and one-half

coal at \$3.50 per ton, or \$8.75 per week. My advice to any person who wishes to build one or two houses only, would be to heat them with brick or tile flues, and that no man should use steam except in an extensive establishment.

REPORT OF DELEGATE TO WISCONSIN.

By J. S. Harris, La Crescent.

The summer meeting of the Wisconsin State Horticultural Society was held at Baraboo, Wis., July 20 and 21, 1887. The meeting of this society was something of a departure from the usual custom of holding it in the midst of the strawberry season, and it proved a very great success, as it was more favorable for securing a good attendance of the members and a fine exhibition of the midsummer fruits. The papers read before the meeting were ably written and full of life, experience and practical suggestions. The people of Baraboo gave maintenance to the meeting by their presence, and every session was marked with a full house.

Liberal premiums were offered for the various varieties of small fruits in season, early and last season's apples, vegetables and flowers; and, although the season was thought to be unfavorable on account of the severe drouth that had prevailed, varieties were well presented, and the quality and appearance of most varieties was fine, demonstrating that some horticulturists had met with something besides "blasted hopes and disappointed expectations."

The varieties of raspberries shown were of blackcaps, the Gregg, Tyler, Souhegan, Nemaha, Ohio and Earhart; of reds, Cuthbert, Turner, Marlboro, Brandywine, Shaffer, Colossal; of yellow varieties, Caroline and Golden Queen. The Gregg and Souhegan were the finest of the black, and Ohio and Earhart the poorest. In reds the Cuthbert stood at the head of the list, although the Shaffer was the largest fruit, and Brandywine the most showy and in best condition; however, it did not seem to be a general favorite.

Blackberries were represented by Ancient Briton, Snyder, Stone's Hardy, Wilson Junior and Agawand. The Ancient Briton was the most extensively shown and generally the best fruit, while one exhibit of Stone's Hardy was very fine, one plate of the Wilson Junior was extra fine, and others were the poorest in the entire collection. I was informed that this variety was not as early as advertised, not

hardy, and very liable to bring imperfect or blighted fruit. The dewberry were larger and finer than the Bartlett, and proved to be more fruitful and better adapted for general cultivation.

Mr. Pepper made an exhibit of seedling apples that were grafted in 1886, of medium size, fair quality and in good preservation. Other parties made exhibits of Duchess, Tetofsky, Yellow Transparent, Early Champagne, and a number of other varieties of Russian origin. The Yellow Transparent and Early Champagne were ripe and in good condition to test their quality, and if sufficiently hardy are of a quality as to be worthy of general cultivation throughout the west.

A significant feature in all meetings of the Wisconsin Society is the prominent part taken by the lady members, and the papers read by them are becoming the most valuable horticultural literature of the day. Cannot we profit by the example of our Wisconsin neighbors and enrich the pages of our future reports with thoughts and experiences of our ladies of our own Society?

REPORT OF DELEGATE TO DAKOTA.

By A. W. Sias, Rochester.

Mr. President and Members of the State Horticultural Society.

This live and progressive institution for the dissemination of horticultural knowledge, the Dakota Horticultural Society, convened at the court house at Huron, December 13th, and closed its last session on the night of the 15th. The meeting was called to order at the usual time by President E. De Bell, of Sioux Falls, who presided with great form, fairness, and with satisfaction to all. It is fortunate for this society and the good cause it represents that it should be so well represented from the very commencement of its arduous duties. It was a most happy surprise to your delegate, on entering the hall where the horticulturists were assembled, to be brought face to face with some of the distinguished horticulturists of Minnesota fame, viz: H. H. Benedict, of St. Paul, a former well known editor of Rochester, and well known to your reporter as an uncompromising friend to horticulture. Also M. Benedict, a former partner in the Rochester nursery of M. Benedict & Co., now of De Smet, and one of the few nurserymen in our State whom the tree planters felt that they could "tie to" as an honor. Also Oliver Gibbs, Jr., who showed all nationalities at New Orleans.

5, that Minnesota was in the habit of "taking no back seat" in exhibits of fruits and other farm products, was at this convention, read an interesting and instructive paper on the Native Plum of Iowa. And last, but I refuse to say least of this horticultural quartet, was the genial, lively Prof. Chas. A. Keffer, of the Brooks Agricultural College, formerly of the Experimental Farm between Paul and Minneapolis. I am well aware that the word quartet is more commonly applied to regular musicians than to horticulturists. I take nothing back, as these gentlemen were not wholly devoid of good music, although they sang solos, while the Farmers' Alliance session at the same time in the adjoining room, indulged in vociferous concert or "congregational music." An unknown member just behind your reporter was heard to remark that "still waters run deep," which of course shows too much prejudice against a great people who stated, as they had a legal right to state, in actions which speak with more force than mere words, that they must divide the Territory of Dakota, and know who was running the government there, before taking up any question of minor import, such as protecting their families from the relentless blizzard and tornado, with wind-growing deciduous and evergreen shelter belts, etc., etc. Hence were the great majority of the Farmers' Alliance were sheltered on the night of the "joint session," "this deponent saith not."

Your reporter is no prophet, but it would appear to a stranger on entering the Territory of Dakota, that arboriculture was a subject of second, third or fourth importance to her people when compared to the other well ordered industries of the country. But we need not despair, for there is leaven enough in the Dakota Horticultural Society to leaven the whole mass.

The first meeting of the Dakota Horticultural Society was held at Huron, Dec. 18, 1884, at which time a constitution and by-laws were adopted. The second meeting was also held at Huron, Feb. 4, 1885. The next at Parker in 1886, and the last at Huron.

Mr. Harris, in an able paper read at our county horticultural society meeting, January 7th, speaks of Rochester as "historic ground," being the birthplace of the State Horticultural Society, its first and second meetings being held here. For precisely the same reason we must be allowed to speak of the beautiful city of Huron as "historic ground."

Mrs. L. A. Alderman, of Hurley, the late efficient secretary of the society, we regret to say, was kept from the meeting by illness. All that is wanted to transform Huron into almost an earthly para-

dise, and render it the best location in the Territory (when for the seat of government for the new state, is for the city to in some shape two hundred or more acres of land west of cultivate the same well for two years in some crop, then if not an object, set with cuttings of gray willow, cottonwood, poplar, or anything that will succeed best in that location, far apart each way, leaving room between this grove and the city arboretum. And when the trees become large enough, lay out through the plantation and convert the whole thing into a beautiful driving park. In this way the city can be protected in a few years from blizzards and tornados, and have "a thing of beauty and joy forever" right in sight.

There is no two ways for the settlers on the "oceanic prairie" they must protect their buildings on the west by shelter belts, or one will some day "get hurt." The railroads might profit by this hint, and set trees on the west side of all depot buildings through all the prairie country they traverse. We can conceive of no better more humane use for a small part of the cash received from the "watered stock." If they say, as the man did who failed in his attempt to get on board the ark at the time of the deluge, that "don't think there is going to be much of a shower," and so heed, they will in that case "sow the wind and reap a whirlwind."

The election of officers Wednesday, the 14th, resulted as follows: President, E. De Bell, Sioux Falls; vice president, G. H. Whiting, Esmond; secretary, Prof. Chas. A. Keffer, of the Agricultural Experiment Station, Brookings; treasurer, Oliver Gibbs, Jr., Ramsey; director of agriculture, A. Wardell, Twin Brooks; for North Dakota, William Clausen, Bismarck; for South Dakota, H. C. Warner, Forestburg.

Where all the papers were especially fine it is not necessary to report on each separately. This was true with the above directors.

Leonard Gee's paper on "Experiments in Forestry" was handled in an able manner, showing conclusively that the writer had been "there" and knew whereof he spoke.

"Shelter Belts" by G. H. Whiting, Esmond. You will notice that this writer takes a subject as broad as our Western history, and that he was master of the situation there was none to equal him. If time and space would admit of it, I should be pleased to spend some time at length in regard to the rare merits of all the papers read at this convention—but there is one thing of vital importance to the rising generation that I must not neglect to mention here, and that is a resolution offered by Mr. Bushnell of Huron, proposing the

ent of a committee to devise measures for the general observance of Arbor Day. His plan was to issue a circular letter impressing upon persons having charge of churches, schools, and other institutions, and upon citizens of towns and villages the necessity of planting shade trees upon the grounds in their charge. Now "The Farmer" of St. Paul deals in good common sense when it says of this resolution: "No doubt a great deal of good might be accomplished by following out this suggestion, and that, too, at a trifling expense to each individual."

Were it not for the friendly and most liberal aid rendered the horticulturists by the agricultural press of the Northwest, our noble vocation would be "up hill" business when compared to its present status. This thought was suggested by noting the lively interest manifested in the Dakota Horticultural Society by the Dakota Farmer, not only at her last convention, but from the day of their organization up to the present time. And when I compare this friendly attitude to similar papers in our own State, such as "Farm, Stock and Home" and "The Farmer," I perceive no lack of interest. These being facts that any man of ordinary intelligence can comprehend—why should not every horticulturist in Minnesota aid the agricultural press of Minnesota with both "pen and purse?"

ANNUAL MEETING OF THE DAKOTA HORTICULTURAL SOCIETY.

By Oliver Gibbs, Jr., Ramsey, Dak.

As you will receive from A. W. Sias, who was present at our meeting at Huron last week, and who, by the way, was made an honorary member, some account of the proceedings, I will leave to him the rest that I had in mind as being likely to interest you. The meeting convened under depressing circumstances, the bill passed at the last session of the territorial legislature providing an annual appropriation to print the horticultural report and to pay the incidental expenses of the society, having failed to receive the governor's signature; and why his excellency had not signed it none of us knew. However, after being together a little while, it was found that the few present were willing to do the work of the meeting just as thoroughly as if an immediate publication was in prospect, trusting that next winter all would come out right, and the public then

have the benefit of the society's papers, correspondence and sessions, in the shape of a proper report.

On Friday, just after the final adjournment, President DeBevoise, President Whiting and myself happened to hear that Gov. Church was in town; and immediately we constituted ourselves a committee to call upon him, and forming in a revolving triangle, give him a call at a time, the three points of it if necessary, in missionary duty. Happily we found that the governor was not one of the unfortunates. Our bill had failed for the sole reason that it lay too near the bottom of a big pile of bills that the legislature had sent him at the last minute of the eleventh hour of the session, and it went with a number of other important and meritorious bills that he could not get time to read at all before the adjournment—nobody having called his special attention to it, or taken any pains to acquaint him with the needs and plans of the society. Gov. Church is an ardent horticulturist and an awakened horticulturist; and the committee, which I left him, carried his invitation to the society to come to him at the next session, or at any other time, and with the assurance of the appreciation and support of any suitable bill.

I mention this as an indication that in another year our society may be on an exchange basis as to an annual report, and to ask that our members may be furnished with the Minnesota Horticultural Report of 1888, to be sent direct by mail to the addresses to be hereafter given. I will remit the necessary amount for postage on the entire list. I will notice from your secretary that the books will be sent.

There were two peculiarities of our meeting that I cannot mention. One was the reports as to the different behavior of the same varieties of trees and plants as affected apparently by local conditions of soil in the district where planted. This was as marked in the well known varieties, between their growth under the same conditions, differences of climate in districts far remote in our great territory. It shows how truly experimental is all our work over here; how we have to learn of local conditions and adaptations, and how necessary is the horticultural society's work, to teach the people of this territory what to plant that will suit the local conditions where they live.

Another peculiarity was the disposition to bring out for cultivation wild fruits, shrubs, etc., and get into general cultivation such as were found useful. The Shepherdii, the Wahoo, the wild thorn, the sand cherry, the service berry, and even the wild gooseberry and the wild currant. Some dainty wild roses were mentioned, as well as our wild roses, which all our horticulturists are becoming deeply interested in.

I add to this list our beautiful ornamental plant, "Snow on the mountain" (don't know its botanical name), which is a common pas-swee in South Dakota. It seems to care nothing for drouth or wet, and is beautiful in all situations; yet when allowed to stand on cultivated ground shows that it can respond as well as any weed to such treatment.

I had a report from a reputable member who had seen it, of a plum on the Missouri that beats any native plum of the North ever yet mentioned for size and quality. But as the wife's apron, attached to the tree for a mark when it was found, had disappeared when our informant went back at the season for sprouts or seeds, the identity of the tree was lost. There is hope that it will appear again at another fruiting season. Mr. Sias can tell you all about this incident in our proceedings.

The next annual meeting will be held at Mitchell the first Tuesday of December, 1888, but there is a probability of a summer meeting in time of strawberries and June roses, at Sioux Falls; at either of which we should be happy to meet any of the members of the Minnesota Horticultural Society. We have on trial, as reported by the members, a good large list of strawberries from which to gather an attractive exhibition, and the stand of plants is generally reported as strong. Of roses, we shall know better what we have got when they come together. President De Bell reports a good rose of damask that is as hardy as the wild rose, and blooms from June till autumn. Its name is *Rosa Ragusa*. We have never had any roses in our garden that were safe in all winters without covering, except the old white and the old-fashioned blush, and these are the better for wintering.

S. In a letter just received, January 8th, from President De Bell, I learn that there is a prospect of getting our report printed through the Commissioner of Immigration. The society is indebted to him to a suggestion made by Gov. Church, at the interview above mentioned at Huron.

The coldest temperature here this winter, thirty below zero. Plenty of snow. It fell during the last of November, and covers prairies, fields and orchards like a tight blanket. Ground froze rather dry, but melted out in December under the snow, and absorbed plenty of water. Badgers were busy digging out gophers during the warm weather in the middle of December, through a foot of snow.

President Elliot announced the following committees on award of premiums for prize essays, viz:

On orcharding and on grapes—E. H. S. Dartt, J. M. Un
and M. Pearce.

On strawberries and raspberries—A. W. Latham, O. F. B
M. Cutler.

On blackberries and dewberries, and on currants and goose
J. S. Harris, A. W. Sias, and Wm. Lyons.

The meeting adjourned until 2 o'clock P. M.



MINNESOTA STATE AMBER CANE ASSOCIATION.

ELEVENTH ANNUAL SESSION,

HELD AT MINNEAPOLIS, WEDNESDAY, JAN. 18, 1888.

The eleventh annual session of the Minnesota State Amber Cane Association was held at Market Hall, Minneapolis, on Wednesday afternoon, Jan. 18, 1888.

The Association met at 2 o'clock P. M., and was called to order by the secretary, Prof. E. D. Porter.

Prof. Porter said a letter had been received from Capt. Blakeley, of Paul, the President of the Association, stating it would be impossible for him to be present at the meeting, owing to pressing engagements elsewhere.

VICE President Day was called to the chair.

The minutes of preceding meeting were read and approved.

After a short intermission for reception of members, payment of annual dues, etc., the following paper was read:

IMPROVEMENTS IN MACHINERY AND PROCESSES OF MANUFACTURE.

By B. Densmore, Red Wing.

The first public expenditure of money under the direction of the Department of agriculture for experimental work in manufacturing sugar from sorghum was made in the year 1885, at the Ottawa Syrup Sugar Works, Ottawa, Kansas. The diffusion process was employed, and the results obtained were general in character. An extraction of ninety-eight per cent of the sugars of the cane was secured, ninety-seven one-hundredths of which could be placed on the market either as dry sugar or molasses.

The Ottawa company was, however, a failure financially. The following year, 1886, the Parkinson Sugar Company was organized at Fort Scott, Kansas, and a commodious works or factory was established as a nucleus in which the department could pursue experiments still further. The buildings, and to a great extent the machinery for these works was furnished by the company, but the more important aids and fixtures, in the form of a complete diffusion battery, carbonatative apparatus, filter presses and vacuum pans, were furnished by the department of agriculture.

Almost, if not the entire, sorghum crop for 1886 tributary to Fort Scott was consumed at these works in purely theoretical and experimental work, concerning which Dr. Wiley, the United States chemist in charge, states in his official report as follows:

"In a general review of the work the most important point suggested is the failure of the experiments to demonstrate the practical practicability of manufacturing sugar from sorghum."

Thus far upwards of \$100,000 of public money had been expended in these experiments, and with failure as the only acknowledged result; but the management of the Fort Scott company, having confidence and faith and being still possessed of undaunted perseverance, made a careful selection of the essential parts of the process already omitted the non-essential and cumbrous parts, availed themselves of all the experience of the past, and, in the season of 1887, achieved that success which finally placed sorghum sugar making among the profitable industries of the country."

The experiments of 1886 were substantially an effort to treat the juice of sorghum cane to the diffusion and carbonatative process instead of which the process should have been so modified or altered as to meet the requirements of sorghum.

Diffusion and carbonatation are employed in Germany and elsewhere and with great success, in extracting sugar from the beet root. The process in full and as there employed is not adapted to the manufacture of sugar from sorghum.

This fact was recognized in 1886 by the Fort Scott management, and in 1887 they, having by experience learned what best method in order to treat sorghum juice successfully, were in a position to take advantage, and prepared to derive all the benefits possible from the process which had been undertaken by the department.

The process of sugar making, as now developed is, briefly, as follows: The seed tops are removed from the cane while yet in the field where grown. The first step at the factory is to separate

and leaf-sheaths from the cane. To accomplish this the cane is cut into short sections, and then run through a system of fanning by the blast of air from which blows out all the light material. The cleaned cane is next cut into fine pieces or chips, and is then taken to go into a cell of the diffusion battery, where it is subjected to a leaching or soaking process with hot water. Each cell of chips is held under this treatment for sixty or seventy minutes.

The diffused juice is said to have taken up and to hold in solution twenty-eight per cent of the total sugars of the diffused chips, and to require about half a gallon of water to each gallon of juice obtained from the cane. Milk of lime is used in the usual manner for defecation, and the clarified juice is then evaporated in vacuum to a semi-syrup, and lastly boiled to grain in the large vacuum or strike pan. Under the most favorable circumstances the time occupied, from cutting the cane for cleaning, to dumping the strike of sugar or milada in the vacuum pan, is about twelve hours.

The encouraging results had with diffusion have fairly brought before the sugar industries of the United States the question of how best to extract the juices from the cane, whether by rolling or grinding in the mill, and thereby obtaining something over fifty per cent, or by diffusion, and thereby securing nearly all the sugars of the cane. It is already evident to practical manufacturers that the best quality and greatest quantity of product can be obtained from cane which has been thoroughly cleaned, hence the first and great desideratum for a successful manufacturer is a machine which will do this work cheaply and efficiently, whether the juice is to be extracted by milling or by diffusion.

The advantages of diffusion consist mainly in the large extraction obtained thereby. Diffusion has, however, its disadvantages—first, the diffused juice consists of one hundred parts of juice from the cane to fifty or more parts of water added in the process of diffusion, and thus the relative cost of evaporation is increased nearly sixty per cent. Second, the exhausted chips or bagasse, being surcharged with water, have no immediate value as fuel. Third, the immediate and determined effect of diffusion is to completely destroy the normal character of the juice. At its best, as expressed by the mill, the juice is very stable in its character and relative bearings. Fourth, diffusion extracts soluble solids and coloring matter to a great extent, and finally as well as sugar, and these, except such a part of them as may be skimmed off or precipitated, finally incorporate with the water, giving a heavy precipitate in a heated solution of the crystal-

izable sugar, or rendering the non-crystalizable sugar, glucose syrup a black opaque molasses of rank flavor. Lastly the process of the diffusion plant places it practically beyond the reach of average sorghum manufacturers.

The report of the Fort Scott works for 1887 shows an average product of 49 pounds of sugar and 10.6 gallons of molasses to the ton of field cane, and an average of $10\frac{1}{2}$ tons per acre, an average of 523 pounds of sugar and 113 gallons of molasses.

The total products from four hundred and fifty acres are reported to be 235,826 pounds of sugar and 51,000 gallons of molasses. The ratio for the season of the analysis of the diffused juice is two and five one-hundredths of sugar to one of glucose, while the ratio for the product is one of sugar to two and one-half (nearly) of molasses.

In this connection the inquiry may not be impertinent as to the loss of sucrose which may be sustained by reason of inversion—a loss ably endorsed by the state of degradation established in the juice by the diffusion process, and which finds ample opportunity for accentuation in the time consumed after diffusion and before the grain is completed in the vacuum pan.

If we allow nine pounds of the above sugar to represent one gallon of molasses, we have on this account 26,203 gallons, or a total of 77,203 gallons of molasses (or syrup).

The fuel account for the amount of cane worked for sugar and molasses averaged, on this basis, thirty-five and one-third pounds slack coal equivalent to nearly twenty-five pounds soft coal per gallon.

Reports from factories employing the mill and open pan evaporation instead of diffusion and evaporation in vacuum, show an average of thirteen pounds of soft coal used as fuel to the gallon of molasses made—a difference of nearly fifty per cent on account of fuel in favor of the mill and open pan evaporation. The highest coal bill reported from these factories is sixteen pounds of coal to the gallon of molasses made, or a difference of thirty-three and one-third per cent in the same direction.

Again, and from the same reports, the Fort Scott factory shows sixteen gallons of molasses to the ton of field cane, having a market value of twenty cents per gallon, while the mill factories show twelve and one-half gallons of syrup to the ton of field cane, having a market value of forty cents per gallon.

These figures cannot be taken as conclusive regarding the relative merits of the two methods under consideration,—milling and diffusion,—but they may be taken as an approximate index of which method to be employed in the future will be.

The juice obtained by diffusion has not yet turned out a product equal in quality to that obtained by milling. Diffusion employs three very active agents or factors—time, heat and pressure, and with these affords a liberal opportunity for the full action of atmospheric influences. Milling employs but one agent—pressure. A careful examination of the statements made shows the relative bearings of these methods.

Briefly, milling with a much higher grade product than diffusion, while the latter furnishes about one-third more in quantity.

Diffusion is a long stride ahead, but it is self-evident that it is yet in a crude form. Whether it will be found practicable to materially reduce the amount of time consumed in the process, as well as the volume of added water and the amount of coloring and other matter extracted with the sugar, and whether the cost of the plant can be reduced to bring it within the ability of the average manufacturer to purchase, remains to be classed with improvements yet to be made.

Prof. Porter said he had hoped Prof. Swenson, the director of the works at Fort Scott, would be present at this meeting, but he had been detained by storms, etc. He had received a letter from him stating he had just returned from Texas, and had not received the letter sent in requesting a report of their operations there till it was too late to comply with the request. Prof. Porter described the process of manufacture of sugar and syrup there and at the works at Rio Grande, New Jersey.

By the process followed at Rio Grande they had secured one hundred and thirty-five pounds of sugar to the ton of cane this past season. With Southern cane the yield is about two hundred and twenty pounds of sugar to the ton. The Southern cane was ahead of the Northern, but when the question of seed and everything was considered, honors were about even.

He thought this whole subject of Amber cane culture had been conducted improperly in this State as an industry, and there was a departure from the objects contemplated when the Association was organized, some twelve years ago. They had heard of the old adage about spoiling a most beautiful horn in order to make a spoon. The object had in view was the manufacture of syrup for home consumption in Minnesota, an enterprise entirely feasible and not requiring much machinery. Too much attention had been given to experiments

in the manufacture of sugar, which required expensive machinery. The only way for the farmer to get pure syrup in Minnesota was to grow it on his own farm, take the cane to his neighbor's mill, put it in the barrel till it was manufactured into syrup, for if left in the barrel a single hour the barrel might be filled with glucose, and the article could be furnished at about one-fourth the cost of pure syrup from the cane. Here was the principal cause for a decline in the Amber cane industry in Minnesota for the past three or four years. Those most deeply interested in the business had been turning their attention to the manufacture of sugar. There was no question of our ability to make sugar, as it had been done by two persons in a room, who had made a success of its manufacture in a commercial way; but it was not worth while for farmers generally to undertake to raise their own sugar till they had succeeded in producing pure syrup that was needed. Half a dozen farmers could club together and grow Amber cane in sufficient quantities to make the manufacture of molasses profitable.

Mr. J. F. Porter of Red Wing was called upon to report on the success with Amber cane. He said he had but few remarks to make on the subject. He had made about 4,000 gallons of syrup the past season, of which amount about four hundred gallons was of pure syrup raising. He had made no effort to manufacture sugar.

Mr. Kenney was called upon for a report and a paper.

AMBER CANE INDUSTRY.

By Seth H. Kenney of Morristown.

Gentlemen of the Minnesota Amber Cane Association:

I have to state that some little time ago I received from an gentleman from the East, through Prof. Porter, a request for a statement of the work on Amber cane. Although I was a good deal hurried at the time, I sat down and wrote a brief statement. As I had been asked for time I requested the report to be returned to me, and here it is.

MORRISTOWN, RICE CO., MINN., Dec. 1, 1885.

DEAR SIR:—Prof. E. D. Porter, of the State University, has forwarded me your letter which is full of practical questions, requiring, to be met in answers, a first-class chemist, however I will give you the facts, using your questions as a basis for replies.

First—As to sorghum sugar. It has not been produced at a commercial profit till the fall of 1885. This has been brought about by

vention of John F. Porter, of Red Wing. A steam evaporator (for information address Densmore Bros., Red Wing.) on the principle that high heat long continued inverts the sugar. The pipes are of copper, and I made on one of them one and one half gallons of syrup per minute on Amber cane juice that tested by SACH ten degrees of density, after defection and juice little below boiling point. Having excellent cooling facilities, this syrup by open evaporation, ran sugar of a good grain right from the coolers into the receiving tank, giving us the finest syrup in the United States, and that is saying a good deal. In proof I shall send a jug by express to you, Here is the secret: good ripe cane, thorough defection, rapid evaporation, rapid cooling. When made I put in 2,600 gallon tanks. The sugar forms in the tanks and settles, and we draw off the syrup; the sugar is at the bottom. We wait till the summer comes when thermometer is 35 degrees. We can drain this sugar 100 pounds to a batch in centrifugal and rewash the drained molasses.

Second—Average production has been so far as my experience goes four pounds per gallon of syrup. The cost has been with me to manufacture about six cents per gallon, not including drawing the sugar. I have not worked with special reference for sugar, but it will come without effort.

The market price the past three years has been 45 cents by the barrel and 50 cents by the keg, price of package added. Price paid for cane with seed cut off leaves just enough wilted so as not to extract green matter from them. The seed we feed to milch cows Boil and feed to hogs, making good pork; boiling to a pulp extracts the astringent properties. The begasse we spread direct from the cane mill and when dry place in a rick or stack for stock of all kinds which do well on it. It must be dried well, and I consider it worth as much as timothy hay; never less than ten tons, average twelve and one-half tons per acre—have grown twenty tons. Never lost but two crops in twenty-seven years, and then not an entire failure. Surer than any crop I know of to give good returns. It cost me to grow forty acres cane to cut, top, and deliver it to mill quarter of a mile, \$1 50 per ton. began September 1st, ended October 1st, only run day time. Run two mills, used about ten and one-half gallons of juice per minute for one and one-half gallons of syrup. If juice was poorer about seven gallons per minute for one gallon of syrup. To lengthen season plant some later; have to use care about frosts. Three degrees below freezing point cooks it some The same cane cut up twenty-four hours before frost loosens the juice cells and prevents rupture, so it is safe

if cut soon enough, say by September 18th. In boiling seed should be hot, then put seed in; it will not burn on kettle top. I have answered your questions as near as possible. Should you wish to see what can be done I will send five gallons in new keg, here, \$2.90. My crop is now more than half sold.

I have jotted down the following additional notes:

Eleven years ago the present month it was thought by quite a number of persons that the Amber cane industry in Minnesota could be encouraged, and to do this successfully required a State investigation. The present condition of the industry is such that we can work with renewed confidence. The reports from Fort Scott, from Rio Grande, N. J., and from our own State, enable us to present evidence that this State, for quality of syrup and sugar, compares favorably with any other state.

To give you anything like a report I shall have to refer to my work. My former factory was made before we had learned the best buildings adapted to the wants of the work; so, early last summer we planned and built four new buildings, with special reference to putting everything in the right place. The results have proved it a good investment.

The boiler capacity of the works is ninety-six horse power, and the engine sixteen horse power. (This might seem to some out of proportion, but it was just right.) I run two cane mills, that furnish about ten gallons of juice per minute. The juice was elevated by two pumps to two settling tanks, of three hundred gallons each. We fill the first one and then the other. As soon as I began to fill a tank I put lime into the juice about one-half the lime required for a good decoloration. The object was to prevent the acids which come from the juice from sheaths from inverting the sugar.

This is in keeping with the work at Fort Scott, except that we have placed the lime on the sliced cane. I have practiced this for many years, and think cane juice ought not to stand without being treated with lime. As we fill one of these tanks in thirty minutes we commence to fill the other, so that when the juice is drawn into the defecators it has not usually stood more than thirty minutes before going into the defecators. It goes from the tanks to the defecators. These are wooden boxes, $2\frac{1}{2}$ feet wide, $2\frac{3}{4}$ feet deep and 10 feet long, lined with copper. They each have a coil of two-inch pipe, fifty feet in length if straightened, which fill with steam and are provided with tight-fitting steam joints, so that by loosening the screws they can be taken out and quickly cleaned; and when

condition will heat three hundred gallons of juice in fifteen minutes, or about one-half the time it takes to grind the corn for that quantity. In these deficators the rest of the lime is added as soon as they are filled. It is then heated nearly to the boiling point, when the steam is shut off, and the thick blanket of vegetable matter removed. It is then allowed to remain quiet to settle the heavier portions which do not raise to the top. This juice is next run into a six-hundred gallon tank, and stored ready for the evaporators.

This storage tank holds the entire contents of the two deficators, and will last the evaporators one hour. I have mentioned this treatment of the juice before boiling. It comes to the evaporator nearly as clear as spring water, with the fodder taste taken out, which, for making the best quality syrup, is absolutely necessary. Now we come to the evaporators, two of Porter's No. 3. They will boil six hundred gallons per hour into heavy syrup. I only use one at a time. Their capacity is from sixty to ninety gallons per hour of syrup, in proportion to the richness of the juice. The advantage of having two evaporators is in cleaning the pipes, which are of copper. We can change from one evaporator to the other without delay, which is all important when we consider ten minutes represents one hundred gallons of juice and the time of seven or eight men. I could say everything for this evaporator, for I owe my success in this business to it, and if I had twenty car loads of syrup I could sell it all at good prices. The business is now reduced to a perfect system, and both sugar and the finest syrup that is made is made with these evaporators.

We have brought samples of 8,000 gallons. I think the entire crop could give four pounds of sugar per gallon, and I feel that I can depend on the results with certainty. The seed almost pays the cost of cultivation. The work by steam requires much less fuel than by the old way of boiling. The demand for the syrup grows better. The last year we dried the crushed stalks, and all kinds of stock do well on them, eating them in preference to wild hay. I learn that most of the syrup, as made by the farmers, was bought up at from 25 to 30 cents per gallon, shipped to Chicago to sweeten glucose, sent back and sold at a wholesale house at about 30 cents, and retailed at from 50 to 60 cents.

There ought to be good cane works in every county to supply the demand for syrup and sugar. It is a direct home trade. It saves transportation, and barrels of it can be exchanged for any kind of groceries. People will buy the pure article. I do not care for the glucose.

I do not know but I have trespassed on friend Densmore's manufacture, but I could not have shown what a perfect industry is now reduced to except I had followed it through.

ELECTION OF OFFICERS.

The Association proceeded to the annual election of officers ensuing year.

On motion, the present list of officers was re-elected, viz.

President—Russell Blakeley, St. Paul.

Vice President—Ditus Day, Farmington.

Secretary and Treasurer—Prof. Edward D. Porter, State Experimental Farm, St. Anthony Park.

Executive Committee—Russell Blakeley, Ditus Day, Prof. Porter, Seth H. Kenney, J. F. Porter.

THE HONEY INDUSTRY.

It was suggested that a few moments be given to discussion of the honey industry, and Mr. Wm. Danforth, of Red Wing, was requested to come forward and address the Association upon the subject.

Mr. Danforth exhibited some fine samples of comb and honey in frames and glass jars. He said:

MR. CHAIRMAN: I don't claim to be a bee or honey man, but I understand the business very well. I have been too much occupied with other kinds of business to make the subject a study, but I consider the honey industry a very important one. Although I have searched around considerable to find a competent bee man, I have not found such a person present in the person of Mr. Urie, who can tell me much more than I can on the subject.

The first swarm of bees he had anything to do with was when he was a boy of thirteen years, when he had followed a stray swarm some three-quarters of a mile and succeeded in saving it. He had taken home, and in two years when he left home he had a fine apiary. He soon found that it could be made a remunerative business. Year before last, he said, we had a ton and three-quarters of honey, and about a ton the past season. He had not been able to give them any attention except about twelve days, the care being stowed by his wife and hired help. It was a rather poor honey season this year.

His method was to work the bees for honey; to control the

pel them to make honey, and at the same time to increase the
ks. Last year his honey at current prices was worth \$600.

Mr. Wilcox. I would like to ask how many swarms you have?

Mr. Danforth. I put forty-one swarms into my cellar.

Mr. Hillman. How do you manage to keep them from the frost?

Mr. Danforth. I keep them in a cool and dark place. They are
quiet from the beginning of the winter till the end.

Mr. Dartt. Do you use moveable frames?

Mr. Danforth. Yes, sir; I have but one kind of hive, and that the
fashioned kind; there are twenty-eight sections in a case for the
plus honey, and when a case is filled we slip another one under
it the top case is filled.

Mr. Dartt. How do you manage your queenless colonies?

Mr. Danforth. We get another queen to supply the bees; we
Italians as much as possible. It is impossible to keep them pure.
I think the natives perhaps finish up their honey in the best shape,
the Italians make the most honey and are the most profitable if
it pure.

Mr. Mitchell. What do you use for pasture?

Mr. Danforth. Mostly clover, of which there is an abundance on
Mississippi bottoms, as well as other flowers.

Prof. Porter. What kind of honey is the best in quality?

Mr. Danforth. White clover and basswood.

Mr. Mitchell. Which do you prefer, natural or artificial swarm-
?

Mr. Danforth. I think most of natural swarming. I think they
the most successful. You can keep them back with the ex-
tractor.

Mr. Hillman. Do you extract the honey, or remove the cases?

Mr. Danforth. That depends upon circumstances. It pays best to
extract the honey. It is estimated that it takes about twenty times
long for the bees to make a pound of comb as to make a pound of
honey. We extract the honey by using the moveable frames, and the
one frames can be used three or four years. But I will give way to
Mr. Urie, who knows more about this subject than I do.

Mr. William Urie, of Minneapolis, was then called upon to address
the Association, and came forward and said:

REMARKS OF MR. URIE.

Mr. President and Gentlemen of the Amber Cane and Honey Societies :

I have made apiculture a study for the last forty years, a good deal of the time, and yet with all this experience I have not fully mastered it. There is a good deal to be learned, and I think it is one of the greatest studies we have. I claim that it is one of the most important insects that has ever been given to man,—the honey bee,—perhaps the least understood. The reason why so few are engaged in this industry I do not know, unless, as the Irishman says, "The bee has a warm foot." [Laughter.]

There was no trouble in getting along with bees with proper management. The first swarm he ever owned was down in Vermont. He traded a tub of maple sugar for the swarm and hive, with the bees stuck in the top of the hive. In those days honey was made by the use of brimstone, but those days had passed away.

The proper way to handle bees was to strengthen the weaker swarms from the stronger colonies, which should be done first to the tenth of May.

He described the method of dividing the swarms. He had increased from two hundred to three hundred stands at one time, and had gained experience in the business in the states of Vermont, Illinois, Maryland and Minnesota.

When he came to this State he brought fifteen colonies, which he increased the first year to forty-eight, which yielded him 1,500 lbs. of as fine box and strained honey as he had ever seen. He had a box of honey with him on an eastern trip, which had been pronounced by experts the finest they had ever seen. Minnesota was as good a state as any other in the union for the production of honey.

Most of the honey produced in this vicinity was from white clover. The sample exhibited by Mr. Danforth was made from different sources, and therefore he had an advantage in producing honey of fine quality. His apiary was located at 2,520 Bryant avenue. He had built a house for the protection of his colonies of bees. It was 12x24 feet in size, and was so constructed as to be as fireproof as possible. There were four air spaces, and the house was constructed as to prevent dampness, and he had no trouble in keeping them through the winter without loss.

Anyone going into his bee-house at the present time would find that in the coldest weather the bees apparently asleep, and consuming

le honey. And they would remain there at the proper temperature until March or April. It was necessary to keep them dry and warm, and if the house was properly constructed, with sufficient air spaces, it could never freeze—not even potatoes. There was nothing like dead spaces to keep out cold.

A great deal had been said and written about the bee moth destroying bees, but the method of preventing their ravages was as simple as B, C. There never was a swarm destroyed by them that was good for anything. It frequently occurs that a colony loses their queen, passing into the air to be fertilized the queen not unfrequently goes into the wrong hive and is instantly killed, soon leaving the swarm minus any eggs and minus any young queens. As a consequence in four or five weeks, if we do not take the honey the millers will. The proper course to pursue is to introduce a new queen, which is easily accomplished; and in a period of fifteen days the colony will be supplied with a new queen. A queen had been known to lay three hundred thousand eggs in twenty-four hours. It is very interesting to observe their habits. The queen does not feed herself, but is fed by the bees, and requires a good deal of food while laying. He had there were a great many patent hives, as well as a great many theories with regard to the best method of raising bees. The Langstroth hive was the best. It was convenient for handling the honey and controlling the colony. A single swarm should furnish from fifty to ninety pounds of box honey. Bees increase faster in a cold than in a warm climate.

He considered artificial swarming the best, and the process was a very simple one. There was always something to be learned in the business. He could take as much profit from fifty good swarms of bees as could be obtained from fifty good cows, and was not afraid to try it with anyone. He would not agree to do it every year, as there are poor honey years, but in an average year he could do it every time.

Amber cane was no doubt a good thing, but he preferred honey to amber cane syrup, as being finer and a greater luxury. Honey could be produced with profit at ten cents per pound. He was fortunate if he could get twenty cents for his box honey, and he never had a poor year. When nice white comb honey sold for less than eighteen to twenty cents it was not a profitable business, and it ought not to bring more than that price. But strained honey at a shilling a pound ought to satisfy anyone.

He had been very much entertained with the remarks on the subject

of Amber cane, and also with the topics discussed by the Horticultural Society. He was much interested in tree culture and even in the fruit line. He had raised four acres of Amber cane in Minnesota. That was twelve or fourteen years ago when we had no irrigation machinery like we have now, therefore the experience would be of much benefit in that line. The Amber cane syrup that is made is very fine indeed. He hoped the industry might be greatly developed in this State. Thanking you, gentlemen, for your attention, he would not take up any more of your time.

Prof. Porter. I want to say a few words on this bee question. I am also from Vermont. I commenced the growth of bees in Vermont the fever badly about thirty years ago. I got it from Mr. Larned. I lived almost next door to him, and I took my lessons in apiculture from him. I prosecuted the business quite successfully for many years, and I think of all the hobbies I have ever had, I have had more real enjoyment from apiculture than from anything else. There is more in the management of bees to interest a man, whether he is a scientist or not, than almost any other industry I know of. The whole economy of the hive is something truly wonderful. It is something that is constantly stimulating investigation. The very first time the bee takes its flight in the spring, until it goes to its winter quarters in the fall.

I concur in what has been said on the subject, but I will now approach it from another standpoint, and that is the horticultural. When passing through the State, I have found thousands of acres of white clover scattered here and there, and apparently hundreds of acres of blossoms where there was a single honey bee. If it were in Pennsylvania, New Jersey, Delaware, Maryland or Virginia, such fields you would have seen swarms of honey bees buzzing about you, gathering nectar from these thousands of flowers. It surprised me. Then again, when I have come to look at the fields that have been planted out covered with blossoms, I have wondered why there were not more bees kept for the purpose of accomplishing complete fertilization. And I have often thought that perhaps the reason why we did not succeed better in fruit culture was that we had neglected the development of the bee industry.

We have plenty of pasturage for bees here in this State, and in this coming season there will be an effort made to greatly develop this branch of farm industry for the benefit of the people, and especially in the interests of horticulture. It seems to me that more attention was given to the business it would tend greatly to making Minnesota a fruit-growing State.

Mr. Pearce. I was engaged in bee culture for some fifteen years in Minnesota, and I think they are very nice for those who understand them. I think the bumble bee and the hornet are our best friends. The common bee never works on red clover. We should never destroy hornets, yellow jackets or bumble bees, as they are the agriculturist's best friends. It is the general practice to destroy these insects, but it is an error altogether.

Mr. Wilcox Mr. Chairman and Gentlemen: I did not intend to say a word on this honey subject, but you have touched on a tender spot, as I am also from Vermont. I consider that this, in connection with horticulture and fruit culture, is one of the most valuable as well as the most pleasant occupations in which we can engage. I brought me twenty-eight swarms of bees to this State with me a short time since, and I expect to make a success in the industry. I believe thoroughly in trying the best, as much as I would in any other stock. I believe in artificial swarming. Many authorities have condemned it, but results show that it is the best. There is hardly any subject about which the general public are so ignorant as they are of the good and bad qualities of the honey bee. About eighty per cent of the honey is composed of pure glucose—in its pure state one of the best sweets we have.

Mr. Dartt. Mr. President, it seems to me Vermont is pretty well represented. [Laughter.] I want to back up the theory of my friends, that the bees are friends to the fruit grower, but I wish especially to confine it to the hornet. I think the hornet is a decided success in that direction. Now on one of my apple trees there was a very fine hornet's nest, and it had also about a barrel of very fine apples, of which I dare say I should not have had any left if it had not been for my friends, the hornets. [Laughter.] One of these prowlers came around who are accustomed to robbing orchards, and when he saw those fine apples he could not resist the temptation to take one or two. He got the apple and the bees got him, and the way he tumbled and rolled in the grass was decidedly amusing. I therefore vote in favor of the hornet. [Laughter.]

Mr. Wilcox said he regretted there was not a bee keepers organization in the State, in order that this subject might be fully discussed, and that it might receive more attention than was being given to it. He was satisfied that the lack of bees had a marked effect in the amount of agricultural and horticultural products produced from a lack of fertilizing, which was accomplished by the presence of the bees; although he thought perhaps they could not work on red clover.

Prof. Porter claimed that the Italian bee could fertilize red clover. This species was better than the ordinary black bee, as it worked earlier in the day and later in the season. He thought bees were the agriculturists' best friends.

Mr. Wilcox said that Italian bees were very much like raspberries, that did very well to advertise and sell, but most of them would fall back upon the Wilson in the long run. It was the same with Italian bees; among all the importations there was none superior to the common black bee.

Prof. Porter said he was thankful for the illustration as to the Wilson strawberry. Of all the new varieties that he had tried during the past twenty-five years, it was about the best, and there was no other variety a thousand quarts of Wilson grown for a single quart of any other variety. But he believed in Italian bees. For ordinary purposes the black bee would answer, and if not protected the Italian would generate and the black bee would take possession of the ground.

Mr. Urie said in regard to the Italian bee, that if it had been introduced black bees would have gone by the board, and it would have been the salvation of the business, and no mistake. He was not selling queens, but he handled them altogether, and had been doing so for many years. He had some doubt about their fertilizing red clover, but it was the second crop.

Mr. Hillman inquired if there were any objections raised to the keeping of bees in cities.

Mr. Urie said he now had one hundred and fifty-eight colonies at his place of residence at North Minneapolis, and had heard no complaints from any of his neighbors. If people disturbed them they were liable to be stung, but he had experienced no difficulty ever. In Aurora, Ill., where he had one hundred and seventy colonies, a few of his neighbors had undertaken to have them moved from the city. They petitioned the common council to do so, but the members of that body took the position that they had no more right to interfere with a man's private business in this than to take away one of his horses or other personal property. He said Italian bees when aroused had stingers and knew how to use them, but when properly managed were as tractable and gave no more little trouble as a lot of sheep. Bees had an aversion to horses and could not endure the smell of ammonia.

Prof. Porter said most of the difficulty experienced in keeping bees in cities was occasioned by the odor from horses, and being in contact with them. They should not be hitched too near

Mr. Pearce had kept bees in the city, and thought a serious objection to them was the damage they did in alighting on clothing hung to dry.

Prof. Porter said as a rule bees will deposit all their excrement within a short distance of the hive. This difficulty would only be observed in the spring of the year.

Mr. Danforth said they hung their clothes near the apiary, and never had any difficulty of that kind.

Mr. Urie said the objection referred to applied only to the first day's flight in the spring. Some people find fault without reason and condemn the whole honey business without any good grounds.

Mr. Hillman said he did not hail from Vermont, although when a boy he used to look wistfully at the wonderful mountains of that State from the hills of Washington county, N. Y., where he took his first lessons in bee culture. It was a profitable business, and he had been much interested in the discussion of the subject this afternoon.

Prof. Porter here suggested that the Amber Cane Association should unite with the State Horticultural Society. There was no sufficient reason for maintaining separate organizations. This subject of Apiculture and Amber cane culture might just as well be considered in the meetings of the Horticultural Society as to maintain separate associations. The time had come when they could profitably consolidate.

Mr. Kenney felt very kindly towards these industries or any other that would help promote the interests of the farming classes, and thought the suggestion of Prof. Porter a good one.

Mr. Harris said he saw no objection to uniting the two societies. It might have a tendency to add strength to the Horticultural Society, and as he was a thorough horticulturist he did not wish to oppose it. It might be well for the officers of each association to consider the matter and take such action as was necessary.

Mr. Elliott moved that the matter of uniting with the Horticultural Society be referred to the executive committee, which was carried.

Mr. Dartt said he felt inclined to favor the bee men, and was a friend to the honey bee. Bees were good fertilizers of the flowers. Why not arrange so that the bee men could come in with the Amber cane growers every year?

Mr. Wilcox. And why not add maple sugar?

Mr. Dartt. Let us have everything that is sweet, but per can save the necessity of having a bee association.

Mr. Harris. Horticulturists will certainly favor the hone it has an important office to perform in the fertilizing of fruit

On motion of Mr. Dartt the meeting of the Association v adjourned.

AFTERNOON SESSION.

WEDNESDAY, JAN. 18, 1888.

President Elliot stated upon the adjournment of the Amb Association that the business of the Society would be resum short session.

It was decided to take up the subject of forestry. Foll the paper prepared by Mr. Smith upon the topic:

THE STATE FORESTRY ASSOCIATION.

By C. L. Smith, Minneapolis.

Mr. President, Ladies and Gentlemen of the Minnesota Hort Society:

Your Secretary has asked me to say something about the the State Forestry Association. We have very little that is report. The appropriation made in 1883 was only partly ex 10,000 copies of the Forest Tree-Planter's Manual, prepared Hodges, were printed, and nearly all have been distributed.

A bill was presented to the last legislature asking for an ap tion of \$3,000 for the Forestry Association, but it failed to b law, and consequently we have had no money to do with. If received the appropriation the board of directors intended to a revised edition of the manual for general distribution, and kept the secretary busily engaged in the work of collecting seminating information on the subject of forestry. Although had no money, we have done something for the forestry i During the year 1887 nearly 1,000 copies of the manual ha distributed at farmers' institutes, county fairs and through th I have answered over four hundred letters of inquiry from p or those who contemplated planting. I have written over tv dred articles on the subject for the various news and agri

pers, and delivered over one hundred public addresses on the subject of tree planting. There is every reason to believe that these efforts have done something towards stimulating intelligent planting and cultivation of trees.

From one county we have reports of over 20,000 evergreens planted at spring; and although the drouth was severe and long continued, the young trees were so carefully handled, so well planted and cared for that over seventy-five per cent of them are alive and looking well. In another county, one prominent farmer became so interested in the tree talks at a farmers institute that he concluded to plant an experimental belt of evergreens, and purchased from a reliable dealer 1000 each of white pine, Scotch pine, Norway spruce, white spruce and arbor vitæ. He reports, November 1st, 80 per cent of arbor vitæ and spruce, 60 per cent of white pine and 40 per cent of Scotch pine alive. I questioned carefully as to some cause for the excessive failure of Scotch pine, but failed to get any information upon which to draw a conclusion. However, as a whole, he is well pleased with the venture. The trees were well mulched and are in good condition to stand the winter. He will add another 5,000 trees to his plantation this year, and replace all that died from last year's planting. The following directions were given him for planting, and he says, he followed them in every detail:

Carefully prepare the ground by deep plowing and thorough harrowing; unpack the trees in a cool, shady place; wet the roots; while planting, carry them in a pail half filled with muddy water; open a furrow eight inches deep—only one furrow at a time, so the soil will be cool and moist; set the young trees about an inch deeper than they grew in the nursery; straighten the roots; work the earth closely around them; pack it firmly; never let the sun or wind reach the roots; keep cool and moist until planted; cultivate after, but shallow; let no weeds or grass grow; do not let the surface get hard; if for any reason frequent cultivation cannot be given, mulch with coarse manure, straw or hay.

I traveled over a large part of the State during May and June, and visited many newly-planted tree plantations. The rage for Russian mulberry and hardy catalpa seems to have subsided. Willow, cottonwood, ash and box elder are the principal varieties planted. I have no hesitancy in saying that for the purpose of fuel or shelter from winds, the white willow gives the quickest and most satisfactory results. The demand for young trees for forest planting has exceeded the supply, and I believe all our nurserymen and tree growers have

found a market for their entire stock each year. I am also well that planting and cultivation is being carried on more intensively than in the past.

In looking over the cellars and packing sheds of prominent nurserymen I find them exercising more than ordinary care in storing and handling stock, with an evident desire to get the stock to the planter in the best possible condition. Such a method of business is worthy of commendation, but I am sorry to say that in some cases there is an evident carelessness in handling stock, a disregard of the interests of the planter that should be classed with highway robbery. Evergreens, young tree seedlings, berry plants, etc., stored in masses, until heating, fermentation, mold or rot had destroyed a considerable portion; exposure for hours to the direct rays of the sun to drying winds without protection of any kind, still further destroyed them. They are sometimes packed in bundles with very slight covering, or in boxes with moldy straw, and are dead or dying when they leave the nursery. We cannot too severely censure such methods, which rob a man of his money, and destroy his interest in planting.

Again, when the dealer had faithfully performed his duty and the trees reached the point of delivery, they were destroyed through the carelessness of the planter. Think of trees laying in a wagon in front of a saloon or grocery store for half a day, without so much as a blanket or sack to shelter them from the sun and wind; trees carried home, left in the wagon over night, or thrown on the ground to be carelessly planted the next day, where they carry on a constant battle with weeds and drouth, till they give up what little life they have.

The intelligent and practical information gathered and disseminated by the Horticultural Society, the Forestry Association, our agricultural press and the Farmers Institutes have borne fruit. A good seed has been sown which has not yet germinated. We are certainly improving, many planters are eminently successful, the field is large, failures are yet too common, our forests are disappearing too rapidly, and farmers do not sufficiently appreciate the advantages of timber.

One careful farmer who has a grove of 1,000 Scotch pine trees with deciduous trees to the north and west of his farm building sixteen years old, and which cost originally \$10, claimed that he had saved in the item of feed alone over \$100 per year for the last eight years. He keeps an average of one hundred head of stock.

sitting his barnyard during such a blizzard as we had last week could have no reason to doubt his statement.

Driving over the prairie during a recent storm we came suddenly leeward of a double row of arbor vitæ, ten years old and about ten feet high; the thermometer might not have shown much difference, but nose and ears indicated a wide variation in temperature between the shelter of that slight windbreak and the open prairie.

A man is asked to improve his cow or horse, manure his fields, rotate his crops, plant small fruits, take better care of his garden, and he will respond with interest, for the benefits are immediate, the results apparent in a year or two at the farthest. Then the benefits are all his own, the interests his own, and he is easily induced to investigate and make use of improvements. But ask him to plant a timber plantation. He replies that it takes too long to get results—talk about climatic influences, that is everybody's business; danger of exhausting the timber supply of the country—there will be enough for this generation, let the next one look out for itself. Tell him that gang plows and gang saws will make a desert of the United States in one-hundredth part of the time it took to destroy Syria, he replies, tell him who inhabits the desert look out for that.

Forestry, to be successful, to be widespread, must be the protege of the State. The interest is too great, the stakes too high, the individual too selfish, the profits too remote, the climatic and sanitary effects too important and the benefits so universal, philanthropists so scarce, that the State should immediately take hold of the matter and do something definite, practical and extensive.

All the governments of Europe are moving in this matter. Timber plantations are held, mature timber is removed under the direction of State officer, the growth of young timber is encouraged, land that for any reason is unprofitable for agricultural purposes is planted to suitable timber, schools of forestry are maintained, and men are educated in all that pertains to the subject.

A bill regarding the setting aside of land sold for taxes, or such other land as may come into the possession of the State for timber purposes and relating to the care of such timber, its cultivation, cutting and sale, was prepared and submitted to the last legislature, but the reception it received was not very encouraging.

That we must eventually adopt some such system as that now carried on in Germany, no one could doubt if they have ever given the subject any thought. The earlier our people accept this as a fact and act upon it, the better for commonwealth and individual. The preserva-

tion of existing forests, the multiplication of timber plantations, the increase of evergreen belts on the farms, more trees along the roadsides and about the farm houses, are all questions of public interest. Anything that will increase the interest in tree planting, and give intelligent directions to all efforts in that line, are of value to the general public, and should receive the encouragement and hearty cooperation of all good citizens.

The law under which bounties are paid for the cultivation of trees is a step in the right direction, but there are some defects which should be remedied by amendments. The Forestry Association should be provided with sufficient funds to employ at least one man constantly to do the work of investigation, experiment and instruction. What the value is known or learned should be put before the people, and the available means utilized to stimulate and encourage the planting of timber plantations and windbreaks.

The Farmers Institute is a medium through which much has been done to further the interests of horticulture and forestry. I have already referred to some of the reasons why the average farmer is not easily interested in forestry. Of course, from my standpoint, the seeming indifference to so important a subject only emphasizes the urgent necessity for pushing the subject before them. We find that when the subject is properly presented it never fails to interest them, but it is sometimes difficult to find room for it at institutes.

For three years I have endeavored to make use of Arbor Day as a means of calling attention to and inciting an interest in tree planting among the country schools. The success has been very great, and last spring I succeeded in interesting the city schools of Indianapolis, and the day was celebrated by the planting of trees on school grounds, with appropriate exercises, including reading and recitations by scholars and teachers. I hope to have more time next year, and by enlisting the county superintendents and other officials, to give a still more general observance of the day. Before we can have a satisfactory state or national system of forestry, we must have a sentiment favorable to such a system. It will take time and much work to create such a sentiment. I sincerely trust the members of this Society, and all citizens who feel an interest in this all-important subject, will do what they can to assist in forming this sentiment.

We have inherited a land rich in natural fertility, with its groves, bubbling springs, running brooks and verdant valleys. Let us not be so greedy for the dollars as to rob our fields of their beauty, or forests of their trees, and so contribute to the drying up of

and brooks, bringing cyclones and blizzards, drouth and cold, and bequeathing to our children a barren, uninhabitable desert. We can leave behind us no nobler monuments than trees and groves. If we multiply these, our lands will be more fertile and fruitful, the winds less harsh, our homes more beautiful, and future generations will arise to call us blessed.

Mr. Brand, the chairman of the committee on pine lands, was requested to present his report.

THE GREAT VALUE OF EVERGREENS FOR WINDBREAKS.

By O. F. Brand, Faribault.

We used to have reasonable winters in this State—winters when there was but little snow, and when the mercury did not go more than twenty-five to twenty-eight degrees below zero, such winters as 1877-8, for instance. Since 1864, I think, we have had three winters that might be called mild, and twenty-four of a different character. Then we can only expect one reasonable winter to seven or eight severe ones. But there has been no winter since 1864 but what stock have needed a good windbreak to shelter them from the cold, cutting winds. If one has a real warm yard into which to turn stock in the winter it will be a saving of the value of at least one-quarter of their feed. This is no exaggeration. That is, if in the ordinary yards and good stables you feed \$400 worth of hay, straw, etc., to your stock, in a yard where wind cannot strike the stock running out in the day time, you would not feed out more than \$300 worth of feed to have your stock in the same condition, and in that way save \$100. There is no reasonable doubt about that. It takes a very large amount of feed to resist cutting cold winds.

What is the best and cheapest windbreak to be had? I answer,

A WINDBREAK OF EVERGREENS,

in my own experience. Four rows of Scotch pine set in 1873 have made a good windbreak for the last nine or ten years, but now they are too open below to keep the snow from blowing through. To protect crops and fields they are fine, still I would prefer one or two rows of balsam fir for that purpose in this windy country.

For a belt of evergreens of ten or more rows I very much admire

the white pine. It does not start quite as rapidly in growth as Scotch pine, but it soon passes it and makes a clean, majestic tree. For the windy, western part of the State the white spruce, white fir, white pine and red cedar are about all that are desirable.

I have a row of white spruce, natives of the State, transplanted from the forest in 1873, and two years later into the row where they now stand twenty-five to twenty-eight feet high—a dense mass of branches and limbs from the ground up. A high board fence could hardly be better to keep out wind and snow. This tree does not grow so fast as the Norway spruce, but is very much hardier and better as a windbreak over the greatest portion of the State.

For a compact, dense windbreak to surround a building, barn and stock yard, there is nothing so good as two rows of native white spruce. Set in the row five feet apart and the trees five feet apart, set so as to break joints. Suppose every farmer in the northwest would take a piece of land eight rods east and west and eight rods north and south and surround it with such a windbreak. If well cared for, in a few years it would be twenty feet high, when a board fence inside to keep stock away from the trees, would be so protected inside that, let the tempest howl and wind blow as hard as it would outside, cattle and horses would at all times be comfortable so far as windbreaks could make them. Then what an ornament to the farm. No money could buy it from the owner. What a benefit in feed. In how much better condition the stock, and if the farmer prospers well the owner would.

Now we see in the older parts of the State fine barns with basements for the stock through the night. In the morning, frequently about sunrise, the very coldest time in the whole twenty-four hours, they are turned out into a yard protected by a windbreak of barbed wires. Of course where there is room for more than ten acres I would advise the planting of more, for I yield the palm to no one being more enthusiastic than myself on the subject of evergreens for the preservation and restoration of our native pine lands. I like to see from two to five acres of evergreens around every farm home, as I once stated in a previous article on this subject.

BEAUTY AND UTILITY.

If a thing of beauty is a joy forever, and gladdens the heart of its possessor continually, of how much greater worth to the appreciation of mind of man must it be, at the same time while imparting pleasure and joy to its owner, it likewise contributes directly or indirectly

terial wants? In the horticulture of Minnesota, where man's most diligent care and greatest skill is taxed to the utmost to counteract the perpetual war of a remorseless climate, I can conceive of no tree or class of trees so admirably adapted to meet the wants of our horticulturists and farmers as our coniferous trees.

There is a grandeur about an evergreen imparted by no other tree. The people of keen perceptions admire them, whether in clumps or single specimens, planted to adorn the humble cottage of the villager on his one small lot, or the palatial residence and extensive grounds of his more pretentious suburban neighbor, or planted in any shape on the ample and capacious farms. I repeat, there is a beauty and grandeur about them which fills the heart of every appreciative person with delight. As windbreaks in this climate they should be regarded as indispensable to the comfort of man and beast; of their benefit to orchards and their influence on fruit trees there can be no doubt, while used as a protection from the severe winds. But it is not only as windbreaks that they are valuable. In this climate remote from water, even though we find hardy varieties of apples which, so far as growth is concerned, seem capable of resisting the extremes of our climate, still they produce but little fruit, owing to the fact that their fruit buds kill or their vitality is so impaired that they produce but little or no fruit.

Evergreens, when planted around and among apple trees, are said by one of our best authorities to continually give off an exoderm of warmth and moisture that reaches the distance of its area in height. Each being the fact, if evergreens are planted around and among our fruit trees a double purpose will be filled, and the evergreens, so utilized by the farmer or fruit grower, will thus be made not only a protection but an imparters of life force, whose power will gladden the heart of each and everyone who lives within its influence. Men derive only on diluted oxygen, purified to a certain extent from the carbonic acid which animals and fires are constantly throwing into it. Collective man enhances the impurity. Is there a remedy? There is, and one entirely under the control of man. It is the absorption of carbon out of the air by increased forest areas, especially of pines, balsam and spruce, red and white cedar. As the commercial world utilizes electricity to do its will, so should the State see that a sufficient number of nature's silent but obedient agents, in the shape of evergreen trees and forests, are raised up to aid in purifying the air and otherwise contribute toward the amelioration of our rigorous climate.

Mr. Brand. I received a letter from Mr. Brown, of Lac county, containing some items of interest.

FROM LAC QUI PARLE COUNTY.

PROVIDENCE, Jan. 6

FRIEND BRAND:—Yours of the twentieth ult. came to hand day. It was marked mis-sent. I will try and answer your questions. The white pines I got of you are from 8 to 12 feet high. They would have been about 3 feet higher but for being twice killed by hail in June. They are looking very healthy and green. I have about forty white pines. I have not far from 500 Scotch pines which are looking very fine. Some of them are from 6 to 12 feet in height. They are mostly from 8 inches to three feet tall. I have some over 2,000 white spruce, mostly from 6 inches to 12 feet in height. A few 4 feet, and the one you sent me is 12 feet high and 18 inches in circumference at the ground; it is a beauty. I have about 100 arbor vitæ, nearly all mere seedlings. You will remember that you sent me an arbor vitæ tree which was about 4 feet at that time; it is now 10 feet in height. I likewise have fifty balsams, all quite small except one which was planted eight years ago, and was then 18 inches high. It is now about 12 feet high. My evergreens are all looking very well and nice.

I notice A. W. Sias speaks of the Norway spruce as his favorite evergreen. I have had no success with them in this county. Ten years ago I planted 300 of them and have not one now. They grew and grew quite well the first season, but nearly all died the first winter. I would take the white spruce first; second, the arbor vitæ, and third, the Scotch pine. These are the most hardy with the evergreens I have planted on my place, and I have seven kinds. The Scotch pines have made the most rapid growth. They have grown from 1 to 2 feet yearly, and sometimes I have transplanted forty of them last spring which were from 2 to 3 feet high; not one died, and they are looking very healthy now. The white spruce grows more dense in its branches and takes a better hold in the earth, and therefore is less liable to get leant by strong winds, which makes it preferable for a lone tree. It can be transplanted with as much certainty of living as any of the evergreens. I am now fully satisfied that all may have a fine grove of evergreens about their homes if they will. I see no reason why we should not have evergreen groves, even on these bleak prairies. I am planting them in my grove; they grow well, even where it is quite

After they have attained sufficient growth I will remove the other trees, when I will have an evergreen forest.

You will see that I expect to live a long time yet. You suggested an article on forestry, but I have not the time now. The snow is so deep and drifted the mail is carried on snow shoes from Canby to Lac du Parle. It snows most of the time, and the roads are getting worse every day.

Yours truly,

J. H. BROWN.

DISCUSSION.

Mr. Pearce. Mr. President, the growing of timber is a business to which every farmer should give attention. I have been in Minnesota thirty years or over. I have observed that our streams are becoming dryer each year by the process which is going on of cutting away our forest supplies. If this system is continued our winters will become colder and our streams will continue to become less year by year. In fact many of the streams will entirely dry up, and I dare say the Mississippi river will become nearly dry in places, and in time this country will become a cold and barren waste.

Forests should be planted everywhere upon these broad prairies, but fear, at the rate we are going on, in a short time the country to the west of us will be depopulated, or it will become impossible for the people to make a living. Sir, there must be forests planted; trees must be planted in bodies; a small amount of timber will not answer the purpose. At least one-quarter of the country should be planted with timber.

This work should be carried on under the auspices of the national government. If we are to preserve the fertility of the soil, and make this country habitable, the sooner it is taken hold of by the government the better it will be for all parties concerned.

Last winter I had occasion to go over some of this broad prairie country, and had an opportunity to talk with some of the people who live in those treeless regions, and they wanted to know what should be done. I said "plant evergreens; plant them by the millions!"

I hope this Society will take some action in regard to the forestry question. We ought to urge upon the government to wake up in this matter. There is no good judgment in being quiet on the subject any longer, gentlemen. A thousand years hence and this whole country will be a cold, barren, desert region, if the present condition of things is allowed to prevail.

Mr. Harris. Mr. President, our Society considered this somewhat last winter and appointed a committee to try and pass by the legislature to preserve such forests as were in the possession of the State and that were not valuable enough for other purposes, and to reforest such portions of the State as had been deforested and the land left to revert to the State. Our legislature paid but little attention to the matter, and failed to take any action thereon. There are timber lands in this State that have been cleared and that are growing up to timber, but which lands have been sold for taxes. It is important that this timber which is growing should be preserved on these lands which revert to the State. If it were the case, large areas in the northern portion of the State could be reforested, and a large revenue might be obtained for the years to come.

We need here in Minnesota, in order to make it a perfect Eden, a vast body of water along our northern borders. As we do not have that the next best thing is to have an abundance of water and to reforest this whole western country. If that could be accomplished it would change the climate so that we could raise a great many crops that we attempt but fail to raise at the present time; it would make the State far better adapted for agriculture of every kind. We should like to agitate this question, and have something definite accomplished.

I tell you, sir, forestry ought to be taken under the wing of the State Horticultural Society. We are recognized as the strong arm of the association in the State of Minnesota in the interest of Agriculture. We, as a society, have labored for the promotion of forestry. The State Forestry Association should be merged into this Society. We are in favor of keeping up that organization if it could be made successful, but as it has been managed in the past it would be more successful if merged in this Society. The more organizations we put together without interfering with their work, the better.

Prof. Porter said that he had observed, in looking up some accounts at the capitol recently that about twenty-two thousand dollars had been paid out in a single year for the promotion of forestry, but did not know how the money was appropriated.

President Elliot stated that he presumed the money was paid for bounties for planting trees along streets and highways, etc.

Mr. Gould. Mr. President, I agree with Mr. Brand and Mr. Brand that the proper thing to discuss now in reference to forestry is the planting of trees on the "western plains" as they used to be called, which embrace Dakota, a portion of Iowa, Nebraska and Kansas.

Now I suppose in order to make this matter of planting forests effective, the national government should take hold of it, but the government never will do it unless the effort is first started by societies and individuals. After the experience of the last week or ten days in which scores and hundreds of people who have lost their lives by the storms which have prevailed on these treeless prairies in Dakota and the west of us, it won't be necessary to cite any evidence that there is an abundant necessity for something to be done to protect life and an existence itself in that region of country; and while we have a common interest in the welfare of our kind we should feel special interest for the protection of the people of our own State. It is well known that many of these people are too poor to get away, and will be obliged to remain. A wall of timber should be erected across these plains to stop the sweep of the furious blasts that come down from the north; and from this side of the rocky mountains, and which seem to gather force as they come across the plains and reach the borders of Minnesota, and strike our timber areas and are arrested in their progress. It is here their force and severity is broken up; it is our forests that afford the protection we enjoy. This Society should exert every influence it can bring to bear for the preservation of forests, and if there is anything that can be done to help cover the treeless prairies with shelter belts it ought to be speedily brought out.

It is said there are localities in Dakota where trees won't grow, and in some places trees will not live to be more than three years old. That may be the fact, but I very much doubt it. I would like to see this Society put itself on record in some way in favor of the national government taking some proper action. One suggestion I would like would be to have a competent man in charge of a bureau of forestry, and placing sufficient funds under his control to enable him to do something in this direction.

Mr. Sias. I think a man must be a fool to undertake to live where a tree cannot be made to live. [Laughter.] If there is anything needed to force him to see the necessity or the good sense of doing what Mr. Pearce says, to plant evergreens out there upon the western prairies by the million, why I would just ask those persons to please read over the list and see how many have been frozen to death out there in that country within a few days past.

President Elliot. We have with us to-day Mr. Oliver Gibbs, a former secretary of the Society, who has recently gone to Dakota. I do not know whether he is a delegate from the Dakota Horticultural

Society or not, but at any rate we would be pleased to hear in regard to Dakota tree planting.

REMARKS OF MR. GIBBS.

Mr. Gibbs. Mr. President, I have long believed that one of the greatest blunders ever made by the United States government, the people of the United States, was in parting with the prairie lands without first reforesting them and preparing the habitation of civilized man. It is not too late to repair this to some extent. Vast bodies of these lands are yet in the hands of the government, and large tracts are also in the hands of the State governments. I believe in reinforcing the theory that is now advanced at Washington by the forestry bureau of the agricultural department, in taking proper steps looking toward a system of reforestation for the lands that are remaining under the control of the government so that such lands may be preserved as far as possible for the future use of the people.

Reforestation in Europe has been conducted for many years under government control, and upon scientific and practical principles. With reference, also, to the uses to which trees are adapted

He said that timber had a marked effect in the amelioration of the climate, but it should be planted extensively to accomplish this result. A good deal had been said in regard to the timber question and its repeal. According to his observation in Dakota, he had been led to believe nearly all that had been done thus far in the direction of growing timber had been done under the provisions of the act, and by people who were trying to protect their tree crop, although as a rule the amount of timber grown on these tree crops was limited and did not amount to a great deal. Trees seem to be planted with little regard to system in the varieties selected or the locations.

The greatest drawback in the way of growing forest trees on the prairies was perhaps in the ignorance of the people who planted them. Those who undertook to grow them were not adapted to the task of reforestation. Many of them had been brought up without the benefit of schools, and knowing little of the principles of forestry or of the culture in any form.

In speaking of the force of the winds on these treeless prairies, he mentioned the fact that in driving across the prairie on one of these days, at a distance of some ten miles, facing the wind, with his wife on the side, they drove two or three miles debating in their own

either to turn back or go ahead; and coming upon one of these timber claims where there was a fine little grove of trees, the marked amelioration in the atmosphere in the vicinity of the grove could be easily observed, and they renewed their journey, passing along to other similar spots upon the prairie.

Indicating the force of the wind he stated on coming from home, on the occasion of his recent trip to the city, he started out for the prairie, skipping over the drifts with a pair of ponies, about the only conveyance in which he could get across the country, and coming along he saw a black object sticking above a huge drift of snow, and as he came nearer saw it was the end of a stovepipe; and on driving forward found a tunnel some three feet square which extended thirty or forty feet under the drift, and was the means of access for the man and his family to and from his dwelling. He saw no smoke coming from the stove-pipe, but concluded there was a family in there, and probably all comfortable and warm, although he did not go inside.

But in Dakota they were becoming awakened as horticulturists and foresters on this subject, and there was no doubt the legislature would take some proper action in the direction of reforesting the prairies. Mr. Church was a very earnest forester.

He would recommend memorializing Congress in regard to taking prompt and decisive action to advance the interests of forestry in the Northwest.

Mr. Underwood said he had had some fifteen years experience on the prairies of Illinois, and more recently personal supervision of timber claims on the prairies of Dakota, and felt like saying a good word for the provisions of the timber culture law. His friend, Mr. Gibbs, did not seem to think very much of these timber claims.

Mr. Gibbs. I do not think they have much effect so far as climatic influences are concerned. It is true they are a good thing for the settler and his neighbors.

Mr. Underwood said he had traveled through Southern Minnesota quite thoroughly while canvassing for the sale of trees some nineteen years ago in the part of the country where there was very little timber.

In passing through the same country some fifteen years later he had been greatly surprised at finding the change that had been wrought in the appearance of the country during that time. He could easily recognize the country, although he had a good memory of the trees. A large amount of timber had been planted out and was beautifully and successfully grown. He had never been entirely foiled in his endeavors to grow trees on tree claims in Dakota, although they had no

moisture there to speak of for two or three years at a time. In the spring of the year he had found very little moisture, and hardly dig a post-hole. He had been overseeing quite a number of timber claims, taking care of some seventy acres of trees, growing for different parties under contract. He thought the timber culture law a beneficial one and ought to be upheld.

Mr. Pearce inquired what per cent of timber claims were fully maintained.

Mr. Underwood said about one-third or one-fourth of the timber claims were first-class. He referred more particularly, however, to his own experience, and could not say what per cent of timber claims were successful.

Mr. Fuller said that one of the land officers at Benson had made a statement that he knew of but two men in his district who were complying with the timber culture law strictly and were making some success in growing trees. That statement was made some six years ago.

[The Commissioner of the General Land Office estimates that 90 per cent of timber culture entries made without securing the reforestation provided for by the provisions of that act at 90 per cent.—SRO.]

Mr. Gibbs said the best estimate he had seen of the percentage of lands that had been covered with forests under the provisions of the timber culture act was about 30 per cent in Dakota and Montana. Under that act only one tree-claim could be taken in a single section, and only ten acres of trees were required. That was a very small amount of timber for an entire section, and so far as climate and circumstances were concerned the operation of the tree claim law was a complete utter failure. So far as accomplishing anything for forestry in the West it would amount to very little. If we wish to reforest this country for the purpose of affecting changes in the climate we must have the machinery of the government set to work, in the manner it is carried out in Europe. He thought there was no better purpose to which the millions now lying idle in the government treasury could be put than to the reforestation of the treeless prairies in the hands of the government.

Prof. Porter said if any action was to be taken in regard to the repeal of the timber culture act no time should be lost. A bill had already been introduced in Congress for the repeal of the act, and he was also for the repeal of the pre-emption act.

Six years ago he had gone on a tour of exploration in Montana and Dakota, and was convinced at that time the timber culture

as a failure; but since that his opinion had been entirely changed. Visiting some of the same localities recently, he had been surprised to find beautiful, thrifty plantations of timber growing. He mentioned one instance in particular, on the Grandin farm, in Traill county, Dakota, where some seventy acres had been planted in trees some twelve or fifteen years ago. The trees were as handsome as any he had ever seen grown. It was necessary that trees should be properly set out and intelligently cultivated and cared for. The trees referred to stood from thirty to forty feet high, were beautiful specimens and almost every tree was living.

One of the greatest drawbacks for success in growing trees upon the prairies was the ignorance of the classes who were trying to grow them. Many of these settlers were from other professions than that of farming, such as stage-carriers, hack drivers, etc. Many of those attempting to open up farms in that new country were middle-aged men, who had made failures in their calling elsewhere. They had followed a little of everything except practical farming. When they emigrated to Dakota for the purpose of acquiring a home, they found themselves totally unprepared, so far as experience was concerned, for agriculturalists or horticulturists; they were as ignorant as to farming operations practically as a child ten years old was ordinarily, and had to learn by actual experience. On planting out their trees upon their new breaking, because they didn't grow timber large enough for fuel in three years, they pronounced the whole thing a failure. The result was, where there was one such person made a success there were a thousand to make a failure; not because the soil would not grow trees, but people there did not understand how to grow them, or failed to give them proper attention.

Mr. Pearce said the difficulty with many people in that country was they were unable to obtain trees. Many of them lived at a distance from railways, and did not know of reliable parties of whom they could obtain trees and cuttings. If trees could be furnished in large quantities to those who would set them out they might be grown successfully. Scotch pine would grow rapidly, and could be furnished at reasonable rates. Thousands of dollars were paid for trees that were of no value. Another thing, trees were too much scattered and set too far apart. They were neglected and the fire allowed to run through them. Many valuable timber claims were ruined after the trees had attained considerable size.

Prof. Schotzka said that according to his experience it would not do to depend upon farmers to extend timber culture; forestry ought

to be under the management of the general government. In forests were maintained at government expense, which had also, of private forests. While conditions were different than those of America, it showed very plainly that some similar policy should be pursued. Ten acres of timber for a quarter section was insufficient. As a rule, one-fourth of the area of the section should be covered with forests in order that agriculture might be carried on successfully. Some definite system should be pursued with reference to varieties grown, character of soil, etc. Farmers are making poor selections, planting such trees as cottonwood, willow, and other inferior varieties. Those were better than to start with on the prairies, till such time as more valuable timber could be grown.

President Elliot stated that Prof. Schotzka had recently done some valuable little work on the subject of forestry, which he advised interested in this subject to procure.

Secretary Hillman stated there had been a mistake on his part in regard to the transportation of delegates to and from the meeting in justice to the St. Paul, Minneapolis & Manitoba Railway company he desired to read the following letters:

LETTER FROM MR. WARREN.

ST. PAUL, MINNEAPOLIS & MANITOBA RAILWAY COMPANY
ST. PAUL, MINN., Jan. 6

S. D. Hillman, Secy., Etc.

DEAR SIR:—I am advised concerning the State Horticultural Society which meets at Minneapolis, Jan. 17th to 20th.

As no application has been made for reduced rates for this via the St. Paul, Minneapolis & Manitoba Railway, I will be glad if you will inform me if such will be desired.

Yours truly,

C. H. WARREN
Genl. Passenger Agent

On replying to the above stating that reduced rates were desired the following was received:

ST. PAUL, MINNEAPOLIS & MANITOBA RAILWAY COMPANY
ST. PAUL, MINN., Jan. 10,

S. D. Hillman, Secy., Etc.

DEAR SIR:—I am favored with yours of the ninth. In reply

y that I have with pleasure instructed our agent at Minneapolis de-
not to return delegates from the Horticultural Society meeting Jan.
17th and 21st at one-fifth fare, under the certificate system as des-
cribed in our circular 95, copy of which will be found herewith.

When writing you previously I supposed the reason you had not
made application to us for these reduced rates was that you presumed
the arrangement was provided for by your agreement with the St.
Paul Association. I regret that such was the case, and think that
probably this supposition accounts for the fact that no mention is
made in your circular of the St. Paul, Minneapolis & Manitoba Rail-
way as being one of those lines which offer reduced rates for the oc-
casion in question.

I now desire to state that we are always glad to offer the benefit of
reduced rates to such societies as yours, and I would be glad if these
arrangements could be made known to the members of your association

Yours truly,

C. H. WARREN,
General Passenger Agent,

On motion of Mr. Harris a vote of thanks was tendered the agent
of the railway company for the courtesy shown the Society in offering
reduced rates of fare.

On motion the meeting adjourned till 7 o'clock P. M.

EVENING SESSION.

WEDNESDAY, JAN. 18, 1888.

The meeting was called to order by President Elliot.

The following telegram from Gov. McGill was read:

ST. PAUL, Jan. 18, 1888.

Vyman Elliot, State Horticultural Society:

Owing to public business which has come up to-day, it is doubtful
about my being able to go to Minneapolis this evening; will try and
be with you before your session ends.

A. R. MCGILL.

Later the following letter was read, explaining further as to his
absence:

EXECUTIVE DEPARTMENT, ST. PAUL, MINN.

Hon. Wyman Elliot, Minneapolis :

DEAR SIR: I made all my plans to go to Minneapolis this a
but have been detained on a requisition case and cannot leave
thus it goes.

Respectfully yours,

A. R. M

Jan. 19, 1888.

The following paper was read by Mr. Cleveland :

STREET AND LAWN PLANTING WITH TREES
SHRUBS.*By H. W. S. Cleveland, Minneapolis.*

Nothing connected with the practice of my profession as a landscape gardener has impressed me so deeply and painfully since I came to Minnesota as the vast amount of wretched work in tree planting from which no satisfactory result can ever be hoped, and the cost of which is literally thrown away. The explanation is simple. It results primarily from ignorance and false economy, and secondarily from the unscrupulous greed of a class of men who are anxious to sustain their reputation to sustain, and are ready to impose upon the public by doing poor work at a low price, or to swindle those who are willing to pay a good price, by furnishing worthless stock.

The rapid growth of new cities and towns creates everywhere the fever of speculation in land. The rivalry of real estate dealers incites them to seek to render their suburban additions more attractive to customers by adorning them with foliage, and applying principles which govern the ordinary transactions of commerce, to accomplish the object by a wholesale contract to furnish and plant the trees.

The real estate men are not as a class familiar with tree culture. Many of them do not know one variety from another, at least as one of them frankly said to me, "I know an elm when I see it, and I call all other trees maples."

It is not to be supposed that such men can have any real appreciation of the careful management required in transplanting and subsequent nursing of trees in order to secure the vigorous

growth which is essential to beauty. Their only object is to sell their lots, and they think the chance of doing so will be increased if the new streets of the subdivision are planted beforehand. They do not expect and rarely find that a purchaser is more critical than themselves, and when the lots are once disposed of they have no farther thought on the subject.

This large demand springs up in every new and growing town and is answered by a class of men, many of whom are as ignorant as their customers, of the nature and requirements of a living plant and think it may be handled with as little care as so much lumber. Their rivalry leads them to under bid each other, and the purchaser closes a contract for the delivery and planting of thousands of trees, at prices that would be ruinous to the contractor if anything approaching the needful care, were bestowed upon the selection, lifting, planting and subsequent nursing of every one of these baby vegetables. The trees are not from the woods or the refuse of nurseries, are torn out of the ground without the least regard to the preservation of their roots, the tops are lopped off, and they are often exposed to sun and air for many hours before being stuck into holes in the ground and left to shift for themselves. The result is that the real estate dealer the next season calls the attention of the would be purchaser of a lot, to the long rows of poles which line the streets, having a few leaves at the top, which at due time are expected to expand into such luxuriant foliage as to over-arch the street, but in reality either perish before the season is over or drag out a miserable existence as unsightly cumberers of the ground. The blame for such a state of things is not to be laid solely at the door of the tree dealers. Its primary cause lies in the all pervading passion for low priced goods of all kinds.—forgetful of the fact that it is fatal to all true economy. Its prevalence is one of the worst evils which taint our social system, and is so much a matter of habit that it betrays itself in absurd inconsistencies,—as for instance the philanthropist who bewails the fate of the half starved sewing girls, but seeks the cheapest clothing store when he has to buy a coat.

There is as much difference in trees as in horses; they show quite as plainly the evidence of good grooming, and I may add that there is quite as much jockeying in the trades.

What should we think of a man who bought horses by the thousand on contract, "warranted for one year?" Should we give him anything but derision if he complained that he had got only a lot of raw-boned, spavined creatures that had never known the luxury of a

curry comb? The horse is a beautiful animal, and a tree is a beautiful object, but it is hardly safe to say that one horse or one tree is as good as another, though practically this is what such amounts to.

MINNEAPOLIS METHODS.

As a contrast to this, and as an example what good work can be accomplished, I may point to the trees in our parks, which have been planted and cared for by the superintendent, Mr. Berry, a man whose success as a tree planter I had been for many years familiar with in Chicago that I felt as if I had secured a prize for Minneapolis. He found that his services were to be had, and introduced him to the park commissioners.

Not three per cent of the trees he has planted have failed, and make such healthy and vigorous growth that already in a few years' time, the groups in the parks are crowding each other, and are thinning them by removing individual trees to other positions. The group serving as a nursery to furnish a supply for further planting, while those on the street,—as witness the Hennepin avenue group,—already furnish extended lines of luxuriant foliage. It is cheap, inefficient work could secure such results. These trees were procured from a responsible nurseryman, who cares for his trees as well as would for living animals. They were packed and transported with the most careful provision for guarding the roots from exposure to frost or wind. They were planted in excavations large enough to hold a liberal supply of rich earth, in which every root was carefully worked out by hand, with fine mould worked in among their tender points. They were well watered and thoroughly mulched, and all through the first and second season after planting they have been liberally supplied with water,—not in dribblets of a pailful each, but with enough drenchings from a watering cart at intervals sufficient to prevent their suffering from drouth. The life of the trees is measured by centuries. It is in swaddling clothes at the age of one or ten years, and must be nursed with the tenderness which such require.

Anyone who expects satisfactory growth with less careful treatment than this will be disappointed. A tree is a vegetable product with no more power to take care of itself than a cabbage. When we think of a farmer who planted and cultivated his crops in this slovenly way that trees are often treated? Would he not de-

penalty he would surely suffer of having only a miserable crop of unsaleable runts? And yet there are plenty of men who are ready to furnish and warrant the growth of trees on terms which render proper care an impossibility, and the reason that such men exist is due to the persistence of purchasers in trying to get good work for poor pay. And as I said before, it is this spirit which casts a blight upon everything we attempt. There is not a branch of art, literature or manufactures that is not tainted with the shams which so many of us are willing to tolerate rather than pay the worth of a sterling article.

As long as there are purchasers animated by such a spirit, there will be sellers ready to supply them, but it is surely a primary duty of such associations as this to warn all who have any hope of satisfactory results to beware of cheap tree venders, and proclaim far and wide the fact that fine trees are an impossibility without expenditure of time and labor, which must either be performed in person or paid for in money. It is simply throwing money away to attempt to do such work cheaply, and thousands upon thousands of dollars are annually expended in the effort.

SELECTING STOCK.

Yet I am well aware that there is another side to the question, and that the evil is not confined to those who expect good results from parsimonious expenditure. Unscrupulous dealers will be as ready to cheat by demanding high prices and claiming a superior quality of goods, as by under-bidding, if they meet with a customer who is more likely to be caught by such a plea. The only safe course is to deal directly with men of established reputation, which they cannot afford to jeopardize by false dealing. A man whose life is devoted to the rearing of trees for sale, who has a large and costly nursery in which the business is systematically conducted of growing the trees from seed, and planting them in nursery rows, transplanting them from time to time as they require wider space, and securing by that means an abundant growth of fibrous roots immediately about the stem, so that they may be removed without injury — a man, in short, who devotes his life to the business, and is dependent for his success upon the reputation he acquires for furnishing good stock, is of necessity a responsible party, with whom it is safe to deal, and from whom it is safe to expect reasonable satisfaction in case of accident.

Such men and such nurseries are easy to find, and if men who appreciate the value of good stock will apply directly to them they can get what they want, and then, if they will pay competent workmen for

planting them and caring for them properly, they may look for factory results; but not otherwise.

In order to secure success in planting it is necessary to know the habits and requirements of the variety selected, and be sure the conditions of soil and position are adapted to its wants. A tree from the woods is sure to suffer from being transplanted to a place where it is fully exposed to the influence of the sun and wind.

Some trees thrive best in rich, deep, loamy and even very moist soil—others require perfect drainage, and some thrive best on sandy soil, and success in planting depends very largely upon careful observance of these natural wants.

Now I have known here in Minneapolis, of trees furnished for street planting on these arid plains, to be taken from rich alluvial soil of low lands where they were growing thick together, and where, having never been transplanted, they had no spreading roots which were roughly cut off with a spade at five inches from the trunk, and then jammed into holes barely enough to contain them, and the sand which had been taken from the hole shoveled back and tramped around them, and the trees were left to live.

I take it for granted that the audience whom I have the honor of addressing here, is largely composed of men who appreciate the truth of these statements and require no argument for their enforcement.

The question of reform is one that commends itself to your consideration, and is one that I confess my inability to solve. It seems that the first step would be to enlighten those who are ignorant and enlist popular feeling in a cause which so nearly concerns our daily and hourly comfort as the beauty of our streets and the homelike aspect of our dwellings and their surroundings. But I have been assured that an audience could not be got together to listen to a lecture on such a subject, while there is no hall large enough to contain the crowds that will gather to see two brutes pummel each other for the prize ring.

What twaddle it seems, to talk of a love of the beauty of our streets and a prevailing rural taste in the face of such facts! I feel that I have listeners who are actively interested in the subject, but outside of those who are in some way connected with the subject there is lamentable deficiency.

VARIETIES.

My experience in Minnesota has been too short to enable me

with authority concerning many of our native trees as regards their adaptation to this locality, but of some I feel no hesitation in report-unqualifiedly in their favor.

There can be no doubt about the elm, the linden, the white ash, the hackberry or the box elder, all valuable trees and well adapted to street planting. I should also place the sugar maple in the front rank, but I hear on all sides complaints of its slow growth, in reply to which I can point to an avenue of sugar maples now averaging two feet through and furnishing a continuous shade, which I planted after I was thirty years old, on the day of President Polk's inauguration, at what was then my home on the Delaware river, and I am still planting trees and urging others to go and do likewise.

My friend, Mr. C. M. Loring, president of our park commission, and one, as you all know, whose taste and knowledge give great weight to his opinion, is a great advocate of the silver, or soft maple, which indeed is a beautiful tree when in perfection, but its liability to be attacked by insects and to be broken by storms, are to my mind insuperable objections. The birches are certainly among the finest of our ornamental trees, and I wonder that they are not in more frequent use. The yellow birch and the canoe birch are superb trees, and the cut-leaved weeping birch has, I think, no rival in its peculiar style of delicate grace and beauty.

I am very confident that the *catalpa speciosa* will prove hardy here, and I have my belief on the fact that not one of a great number planted three years ago on our Central Park, showed the least sign of injury from the extraordinarily severe weather of last winter. Its rapid growth and the great durability of its timber make it exceedingly desirable for extensive planting. I have here some samples in evidence, which you may be interested to examine. They were sent me by Mr. E. E. Barney, the well known manufacturer of cars at Dayton, Ohio, who uses the timber very extensively in his business, and urged its extensive cultivation. You will see by these samples that it is a beautiful wood, susceptible of a fine polish, and the fact that one of these pieces is from a post that had been in the ground forty-seven years, and another seventy, shows that it is practically indestructible. Unfortunately, the wood is not hard enough to resist the wear and tear of railroad travel, and refuses to hold the spikes when used for railroad ties.

NATIVE OR FOREIGN TREES.

The general statement may be advanced with certainty that our

own native trees are better adapted to our wants than any ones, and will be found in the end to give much more satisfaction; and when, in addition, we reflect that we have more than as many species as are found on the continent of Europe, and of them excel in grace and dignity, and in beauty of autumn, are beyond all comparison with the forests of Europe, it would be a waste of words to urge upon tree planters to look no further to our own resources for supplying their wants. But the great defect lies in the scarcity of such material in our nurseries, which, with the exception of a few native varieties which are well known and in constant demand, like the elm, ash and maple, are stocked almost entirely with foreign trees and shrubs, often inferior in beauty, and found to be less durable than native stock which may be close at hand and eagerly sought by foreign tree growers.

European trees, after fifty years trial, and in repeated experiments with great promise for a long time of highly satisfactory results, almost without exception proved inferior in beauty and durability to our native stock.

No foreign evergreen can compare in majesty and beauty with our white pine, our hemlock or our white spruce. The same comparison may be made between the English elm, the European linden and our maples, and ours.

The European oaks are altogether inferior to ours in number and character, and yet we may see how little we appreciate the beauties of our native forests, in the contempt with which we regard the overcup oak, one of the most picturesque of the species, and highly prized by foreign cultivators, but ruthlessly destroyed with the contemptuous remark that "its nothing but a burn, and isn't worth saving."

The Norway maple, the European larch and the French white pine, low, are importations which have proved well worthy of adoption and culture in this country.

The Japanese ginkgo tree has proved so valuable an addition to the list of ornamental trees at the East, that it is well worthy of trial here, and it is probable that many very valuable additions may be made from Japan, China and Eastern Siberia, the climate of which regions correspond more nearly with our climate than any portion of Western Europe.

ORNAMENTAL SHRUBBERY.

It is not as generally known as it should be that the seeds of

bs carry with them and perpetuate, not alone the characteristics, but constitutional strength or weakness of their parents. Thus trees of y variety grown from seed brought from California, are too delicate to bear the climate of the Eastern states in the same parallel of ude, while the seeds of the same varieties grown on the eastern e of the Rocky Mountains produce trees which are perfectly ly.

n order to a proper knowledge, therefore, of what to plant, it is ntial to know not alone the limits to which the general distribu- of its species is confined, but the exact physical conditions of the icular locality from which the individual tree or seed was brought, it is largely owing to the utter neglect of this necessity that so ll a proportion of the trees that are planted ever attain such a de- of luxuriance and beauty as to excite admiration, or even attract cial notice.

a regard to shrubs for ornamental planting, I should feel that it presumptuous in so new a comer to Minnesota as I am to offer ad- as to selection of foreign varieties best adapted to the soil and ate, but I feel no hesitation in urging the liberal use of the rich e of native shrubbery with which the woods and swamps are d.

have wished ever since I h v e been here that I were so situated t I could make a collection merely for my own gratification of the utiful wild shrubs of Minnesota, many of which I never saw till I e here. They could be easily grown from seed, and any nursery- n might supply himself, and render a more valuable service by in- ducing them to purchasers, than by confining himself to the lists ch are sent to him from abroad.

am very glad to learn from Prof. E. D. Porter, superintendent he agricultural college of the University of Minnesota, that this ject has already engaged his attention, and he has begun the col- ion of native trees with a view of making an arboretum in which he trees, shrubs and flowers of this region may be represented. e grounds of the experimental farm certainly offer the most appro- ate place for such a collection, and it will form one of the most ructive and interesting features of the institution.

Mr. Berry has drawn liberally from these native sources for plant- on our parks, and many of the most attractive groupes of shrub- y are composed entirely of shrubs transplanted from the woods in immediate vicinity of this city. That which covers the little and in central park and the adjacent shores on each side the bridge

is almost wholly of this description, and no portion of the been more admired for its picturesque natural effect than this.

The use of shrubbery for ornamental effect, it appears to be appreciated as it deserves to be, largely owing no doubt to ignorance of how to make judicious use of it, which cannot be learned in books, and which few of our people will take the trouble to learn by practice.

EMBELLISH THE LANDSCAPE.

One of the most important and desirable objects in the management of grounds, whether public or private, is to secure variety. On entering a park, or a private estate, you find that you cannot see the whole area at a glance—or see all the arrangements from any one point. You cannot profitably derive the pleasure and interest from the prospect that you would have if they were revealed to you in succession so that each would be a new surprise.

Suppose for instance on entering the grounds of a villa residence a few acres you find a level area of perhaps an acre between the highway and the rest of the ground sloping down to the stream,—beyond which you have a distant view of the city and the wide expanse of beautiful country. The whole area, if left unobscured, would be seen at once on entering the place from the highway, and the proprietors would have the feeling that it was on all accounts not able to impress every visitor with a just conception of the amount of ground he had secured from the outset, and would perhaps arrange the approach way to the house so as to afford the best possible view of the prospect, which would absorb his attention at once.

But now suppose, instead of this, that the entrance drive is screened, and groups of trees and shrubbery so planted, that when a visitor reaches the house he would see only the area in front of the house which might be so arranged with lawn and flowers and trees as to have a pleasant, homelike aspect.

He enters the house, and passing into the parlor the whole of the distant view bursts upon him as a surprise as he looks from the window. The same thing can be repeated in detail in the various divisions of the grounds, so that a walk through them will be a series of surprises, and convey the idea of a much more extensive park than they really comprise. Now, a chief object in the planting of shrubbery is to aid in securing this effect of subdivision, and properly done it serves the purpose so completely that paths or other open spaces may be effectually screened though only a few feet distant.

Very few people, however, ever think of such an object in planting. They buy flowering shrubs with which they are acquainted or which have been recommended to them, and plant them wherever they think each individual will show to the best advantage, and without a thought of the possible effects which might be secured by the tasteful use of groups and masses. The true art lies in economizing the sources of pleasant interest so as to make the most of each, and the value of nursery as a means of securing that object in the most natural and successful manner is apparently little appreciated.

The landscape gardener is rarely able to direct in person the execution of his plans, and the result as carried out by others, whose ignorance or conceit often leads to the introduction of their own ideas, is generally widely different from his original conception.

The chief hope of improvement lies in the action of such associations as the State Horticultural Society in disseminating information and encouraging the taste for rural pursuits, the love of nature and the tasteful development of the resources with which we are so richly endowed. The presence of such an assembly as I have the honor to address this evening affords the best guarantee of increasing interest in the subject, and I beg leave in conclusion to thank you for the kind attention you have given me.

At the conclusion of the reading of the paper, on motion of Mr. Morris, Mr. Cleveland was given a vote of thanks, and made an honorary life member of the Society.

President Elliot stated that Mr. Cleveland was one of the first members to join the American Pomological Society, having attended its first meeting.

Prof. Folwell, of the State University, was then introduced and delivered a very interesting and able address.

THE DISPOSAL OF CITY CLEANINGS.

William W. Folwell, LL. D., Professor of Political Science in the University of Minnesota.

Civilized man is the only animal which willingly lives in its own filth, while claiming to be the only animal intelligent enough to know the consequences.

The brutes are generally cleanly; and human savages, being wanderers, have the advantage over civilized man that they can easily move away from habitats which have become unendurable.

The civilized man deliberately and knowingly sits down amid the accumulating offal, trash and excreta of generation

On the site of old Troy three successive cities have been built, many layers of made soil. The Roman forum, lately uncovered, has been lying for centuries under fifteen feet of material, most of it composed of deposits of a cattle market.

Millions of our species have gone into premature graves by reason of black death, plague, Asiatic cholera, typhoid fever, diphtheria and other filthy diseases, and to-day in our modern cities and towns the same sands are going the same way.

The economic efficiency of vast numbers is reduced by an incalculable amount, and the expense of maintaining invalids is an enormous increment of loss.

The mediæval way of accounting for all this death and loss was to attribute them to the Divine vengeance, punishing men for their sins; this was merely a theological expression of a fact not now doubted, that disease and premature death are inevitable consequences of modern living.

Fortunately sunshine, fresh and unlimited air, and rain are so friendly and protective. Fortunately, also, men are so scattered over the surface of the planet that these protective agencies, combined with the natural disinfecting qualities of soil, can dissipate and disarm the diabolical forces of disease.

But this scattering of population is less thorough than it was in generations ago. City life is always fascinating. Co-operation, comforts and pleasures are easy in towns. Men are gregarious and enjoy keenly the nervous sympathy and stimulus of crowds.

There is no longer any recollection, there is no actual tradition of the great city plagues. That last survival of the feudal institution, the country gentleman, has moved into town. The roadside smith, the weaver, shoemaker and their fellow artisans have been swallowed up by the great factories which environ our towns and cities.

It seems useless to lament this inevitable tendency.

The first census of the United States in 1790 showed that three-tenths per cent of the people to be in the cities. In 1850 the percentage had doubled, in 1880 quadrupled; and in 1890 it had held twenty-two and one-half per cent of the population.

In England sixty per cent of the people were in the cities in 1881, in our own country will soon see one-half of its population crowded into cities.

The most vexatious problems of politics, economics and

the age are city problems. Democracy has failed in many of our large cities and the people are calling wildly on State legislatures for protection. In this very town (Minneapolis) citizens have been publicly asked to contribute to the support of a soldiery, liable to be useful in putting down the "dangerous classes."

Passing without mention a large group of city problems I come at once to the sanitary problem. As life and health are more precious than all other things, the sanitary interests of cities outweigh all other interests. And still I think it can be shown that in the long run the economic interests of a city are best subserved by effective sanitation at almost any cost. If citizens mean to live and live well they must provide for these fundamental things:

1. A well drained and uncontaminated terrain for their city.
2. An abundant supply of pure water.
3. The uninterrupted access of fresh air to all passages and enclosures.
4. The removal and purification of filth and rubbish of every kind.

If cities were built ideally according to plans and specifications, these fundamental things would be attended to first of all. As a matter of fact they are tardily undertaken when the increase of disease and death frightens the powers that be, into action. And it rarely happens in this land of local administration, that any orderly plan is made or followed.

It is of one of these four fundamental things, the removal of city rubbish and filth, that I am, by the kind invitation of your president, permitted to speak at this time. If the subject should prove uninteresting I throw the responsibility on his broad shoulders, well able to bear it.

Next to the people who create the filth of the cities, the market gardeners, fruit farmers and dairymen who environ modern cities, are most interested in its proper disposal. In an ideal state of cultivation every particle of decomposed animal and vegetable matter goes back to the soil whence it came. The waste and offal which are now filling and polluting our streams, lakes and bays and destroying their fish, will some day cover places now desolate with blooming gardens and fruit-laden orchards.

It seems to me that without delay a goodly portion of the city filth should be put to its proper use of fertilization in the neighborhood of cities. I should be glad if this paper would set a single person to work on this problem. I hope it may set more than one to thinking.

Some account of various plans for disposing of city offal may prove interesting and furnish suggestions for further efforts.

The matter to be disposed of is conveniently separated into parts:

1. Solid matter, not excreta, including sweepings, ashes, and litter.
2. Excreta, i. e. fæces and urine.
3. Foul waste, including house slops, and the waste of factories of many kinds.
4. Surface water.

Let us eliminate the first and last elements.

Of the first, solid matter, not excreta, the only thing to do is to collect and cart it off to some suitable place. As to its ultimate disposition I will speak farther on.

Of the last constituent, surface water, it needs only to be so disposed that it must be allowed to run off in drains, closed or open. Of late years there has been a very lively debate between advocates of two different methods for disposing of surface water. One party clamors for a "separate system" of drains, independent of the sewer system; the other party prefer to turn all rain water into the ordinary sewers, enlarging their capacity accordingly. The "separate system" has obtained considerable acceptance in London.

For our purpose we need to remark that any attempt to carry surface water-carried sewage is immensely increased in difficulty if it is mingled with surface water. It is, I think, probable that the "separate system" may come into extensive use on this account, but those who question this.

There remain for further consideration the other two constituents, namely, Excreta and Foul water.

Before the introduction into England toward the close of the eighteenth century of the ancient Asiatic water closet, it was the custom to remove excreta in wheeled boxes or tubs, and allow foul water to run off in open drains. The formation of sewers was an afterthought. The great Cloacæ of the Romans, the huge original conduit of the first sewers of London, were constructed to drain off surface and ground waters, those in particular of certain streams and swamps.

When the slop waters of a city became voluminous and the discharge in open drains intolerable it was a simple device to put them out of sight by turning them into the great underground drains. The extension of lateral and tributary sewers was a natural consequence. The introduction of water supply systems into modern cities has brought the water closet into extensive use, and along with it the

"water-carriage system" of removing excreta. This consists in simply turning all faecal matter at once into the common sewer to float off to the point of discharge. The water-carriage system is so cheap, convenient and effective that it is not likely to be supplanted in our time.

There is but one competing system, the so-called (from its inventor) Liernur system in the city of Amsterdam, Holland. That city cannot discharge its sewage into the sea because it lies too low in the water. By means of powerful air pumps, operated by steam power, the sewage is sucked through iron pipes to a central receiver. There the water is expressed, the solid residuum dried and converted into a valuable manure. The system is reported to be effective, very favorable to good sanitation, but not economically cheap.

Modern sewage is composed, then, of excreta and foul water, with or without rain water. A previous generation thought to have disposed of sewage by turning it into underground drains and shutting it out of sight. All it had accomplished was the partial removal of a nuisance from door yards and kitchens to the mouth of the sewer. I say partial, for the sewer itself now became the nest and brooding place of deadly gases, which no Yankee ingenuity in traps and seals has ever completely shut out of houses. The royal blood of England was poisoned almost to death but a few years since by sewer gas emptied into a palace through the most scientific appliances.

And the question is before us this hour: How shall we dispose of our sewage so that it shall not dispose of us?

English experience here furnishes the most valuable suggestions. The immense increase of manufacturing establishments, such as woolen mills, paper mills, dyeing and printing works, bleacheries, gas works, etc., so polluted the rivers of England that parliament intervened in the famous Rivers Pollution act of 1867. The operation of this act led to numerous experiments for purifying sewage.

Besides this there was, as there had been for centuries, the sewage problem of London. In former times the slops of London went into the Thames as that stream flowed through the town. Then the outlets of the sewers were carried down stream, and then still further down. A half million tons of solid matter turned into that river yearly have threatened to ruin navigation, have destroyed the fisheries and created a nuisance beyond the power of words to describe.

Without going into details, we may group the English experiments under three heads. Of course I do not count the ancient no-system of simply letting sewage flow where gravitation and tide would let it flow.

1. SIMPLE SUBSIDENCE.

This plan is that of emptying the liquid sewage into large tanks or vats, in which the solid matter settles and the liquid overflow passes into the nearest stream or tidewater.

Such is the condition of some English rivers that this effluent water, although loaded with deadly organic poison, is actually purer than the stream into which it may issue. This was the case at Leeds where a costlier plan of sewage disposal was abandoned because it turned out the waste water cleaner than the river.

Under this system the solid matter called the "sludge," is carted or barged off to some place of deposit on land or water. This plan may serve well as a temporary one for small cities.

2. IRRIGATION.

As the word indicates, this system disposes of sewage by discharging it by means of suitable piping over areas of agricultural lands, being itself purified while enriching the soil. The plan is not new.

The town of Bunzlow, in Germany, has had a sewage farm in operation for three hundred years.

The Craigentenny meadows, near Edinburgh, of four hundred acres, have received a good share of the sewage of that city for a hundred years, and that to great profit.

A number of English towns, among them Croydon, Cheltenham and Blackburn have adopted the irrigation system.

The city of Berlin, built on a sandy plain, has of late years introduced this plan on a great scale. Still later Paris has begun disposing of a portion of her sewage on land lying west of the Seine.

A drawback to this plan is that lands do not always need irrigation, while sewage flows incessantly. If no other remedy is devised the surplus must flow off by some waterway. The experience of Berlin and other North German cities shows that the cold of northern winters does not preclude the discharge of sewage upon land.

In mild climates and in the warm season anywhere, a modified form of the irrigation system promises to serve as a useful adjunct for disposing of sewage when not needed for irrigating. This modification consists in flowing the sewage off the fields on to small areas of land thoroughly underdrained to a depth of six feet or more. The soil to the depth of the drainage becomes a great filterbed, holding solid and suspended matter, leaving the filtered water to escape by the drains.

By alternating the flow between several plats, and thus leaving them to the operation of sun and air at intervals, it has been found practicable to discharge the sewage of 1,000 people on each acre of porous soil. Irrigation—"broad irrigation" as we may now call it—requires an acre to each 100 people. The Royal Commission of England in 1832-84 recommended the "intermittent filtration plan" for London.

3 PRECIPITATION.

There are many contrivances under this head all having for their object the acceleration of subsidence of suspended matters. When quantities become large, subsidence is slow, and decomposition sets in. To quicken subsidence various chemical substances are mingled with the sewage in the settling tanks. Lime in the shape of milk of lime at the rate of one ton of lime to one million gallons of sewage has come into commonest use. Other chemicals employed are ar and chloride of magnesium or of lime, sulphate of alumina, proto-sulphate of iron, and a mixture of clay (alumina), blood and carbon. The system employing alumina, blood and carbon is called for shortness the A, B, C process.

After precipitation by whatever process, the effluent water still holding organic matter in solution may be variously disposed of. It may be discharged into the sea or a stream. It may be used for irrigation or filtered through soil. The city of Birmingham, of 600,000 people, precipitates by the milk of lime process, and irrigates 1,200 acres of land with the waste water.

The disposal of the sludge still remains. It is of little value for manure, and has a gelatinous consistency which makes it very difficult to handle. On the seaboard it can be pumped into barges and carried out to sea. I meet nowhere with any satisfactory suggestions for handling the sewage sludge of inland cities. It can be made into bricks and has been made into a cement, but not at a cost to warrant such manufacture.

An experiment at Aylesbury, a town of 29,000 people about forty miles northwest of London, offers a probable solution of the problem for small cities. The A, B, C process of precipitation is used. The sludge is dried, ground with some sulphate of magnesia and sold under the name of native guano at \$17.50 a ton. The material as it issues from the filter press resembles oil cake, and is quite inoffensive. Ten hundred weight of it doubles a crop. It is reported to be better than stable manure or Peruvian guano.

The difficulty of applying the Aylesbury plan to London and other great cities, is that the immense proportion of inert mineral matter in the sludge reduces its value for manure out of all proportion to cost of handling.

To lessen this difficulty a combination of the systems of simple subsidence and chemical precipitation has been proposed by a Major Gen. Scott, of England, who appears to be acknowledged as an expert in sanitary matters.

This plan proposes to flow the liquid sewage from the mains first into great settling tanks, where the mineral matters in suspension are to be allowed to subside. It is calculated that two-thirds of the solid matter, nearly all mineral, will settle. Naturally some organic matter will be carried down. From these settling tanks the sewage water, bearing little but organic matter and that in solution, is to flow into a second set of tanks, when some defecating process, such as the lime process of precipitation, is to be applied to it. This is expected to yield a sludge so rich in organic matter that the manufacture of a fertilizer will be profitable. It is further proposed to enrich this organic sludge with superphosphates. The sludge of the settling tanks must be removed by barges or wagons, and may serve for filling low lands; if not, it must go out to sea. The effluent water, nearly pure, may be discharged as may be found convenient.

4. MECHANICAL FILTRATION.

This system, nowhere in operation except in an experimental way, is interesting because it is a Yankee invention, and because I believe it to point towards a simplification of the sewage problem.

Not many years ago a Mr. Hyatt, of Newark, N. J., invented an apparatus for filtering on a great scale water for house use and manufacturing purposes. An example was shown in the Minneapolis Industrial Exposition of 1886. This apparatus forces the water, treated with a solution of alum, through a filter bed of pulverized coke and clean sand. The novel feature is that of cleaning the filter bed by simply reversing the current for a very short time, once in say twenty-four hours. There can be no doubt of the efficiency of the Hyatt apparatus, on a moderate scale, for cleansing waters. A thousand towns and cities are already using it.

The claim is now made that this apparatus will filter liquid sewage effectually, and deliver the water purer than most unfiltered drinking water. As an instance: An experimental apparatus set up in Chicago has, it is alleged, delivered water purer than that of Lake Michi-

igan, as furnished by the city water works. Mr. Hyatt has lately made a proposition to the city of Paris to filter its sewage, guaranteeing to discharge the water perfectly pure into the Seine.*

The advocates of mechanical filtration are not bound more than other people to dispose of sludge, but Mr. Conant, editor of the *Sanitary Era*, a journal published to advertise the Hyatt filter, advocates with great earnestness a plan for purifying sludge with dry earth. His idea is simply to mix a sufficient quantity of dry earth with sludge to deodorize it, and to repeat the process until the mixture becomes a fertilizer equal in value to Peruvian guano. I do not learn that any machines or appliances have been devised for working this plan. It seems to me to be one of great promise, but the cost may postpone its introduction for a long time.

We have briefly described the systems of sewage disposition worthy of serious consideration.

They are, to recapitulate:

1. Simple subsidence.
2. Irrigation, with or without intermittent filtration.
3. Chemical precipitation of the whole sewage, or of a residuum after subsidence of suspended mineral matter.
4. Mechanical filtration

At the risk of unduly trespassing on the time of this meeting, I propose to devote the remainder of this paper to an answer to this inquiry: What, in view of past experience and present knowledge, may be reasonably undertaken by an inland city, such as Minneapolis in the way of cleaning?

Two things we presume: First, that the cleanings of a city are not to be dumped into rivers, lakes, or other waters, or deposited on lands where they will be a nuisance. The spectacle of a city of the size and pretensions of Minneapolis or Saint Paul, emptying into the Mississippi river thousands upon thousands of tons of solid and liquid filth and offal yearly is one to make angels weep and men blaspheme. Men who will hold the offices of mayor, alderman, or health officer, and not make it their first duty to lift their voices for some kind of civilized scavenging and sewerage are fit representatives of a people who are content to sit in the midst of their filth and pray the good Lord not to scourge them with tuberculosis, typhoid and diphtheria.

Exasperating as official inactivity may be, the mournful, humiliating part of the business is, that we, the people, are so blind, so ignorant, and so intent on living that we forget to live.

* *San. Era*, Dec. 15, 1887.

The first duty of a city is to clean itself, and dearly does any city neglect this duty.

Another thing to be presumed is, that the cost of thorough cleaning is a secondary consideration. A better statement would be that a thorough cleaning at any cost will pay; pay in the influx of population to a healthier city, pay in increase of values, pay in a lessened death rate, and a cleaner bill of health.

A third thing to be most heartily desired is the co-operation of a large body of intelligent cultivators to utilize the best at least of the fertilizing material now filling up and polluting the noble river which belongs to us simply to use and not to abuse. Upon these assumptions let us attack the practical question first proposed.

For clearness, let us recur to the classification of city filth already named. Four sorts:

1. Solids not excreta.
2. Excreta.
3. Foul water.
4. Rain water.

The first class, solids, consisting of street sweepings, dust, ashes, stable litter, garbage and rubbish should be collected systematically under compulsory regulations and removed.

House ashes, dust and garbage should be kept under cover till emptied in the public carts. Stable litter, if not removed by proprietors within reasonable time, should be carted off by the public scavenger and the expense charged upon the property.

Street sweepings are already removed by a public agency.

All of this service should be managed as a department of the city government, just as much as the water supply. It should be compulsory, and should be effective enough to keep all streets and alleys, all grounds and areas absolutely free from accumulations of filth. No syndicate or corporation should be allowed to levy a tax upon the people under the guise of a franchise.

The removal of this class of cleanings must be followed by assortment and ultimate disposition. In the first place, none must go into the river and none on to lands to be a nuisance.

Street sweepings, dust and ashes may go to filling low grounds until they shall be in demand for fertilizing.

Stable litter, garbage and rubbish may be "cremated," in whole or in part. The burning of this material is now rendered perfectly feasible by ingenious furnaces with two fire boxes. Cremation is no new device. The Gehenna of ancient Jerusalem was the perennial fire on which the offal of that holy city was consumed.

The second class, excreta, solid and liquid, is that whose prompt and innoxious removal is of first importance. There is no help for it but that excreta must go into the sewers, until the present fashion changes and better means of removal are organized. And better means might easily be organized. The power of common dry earth to thoroughly defecate night soil has been placed by experiment beyond all question. The day will come when all this material, purified by dry earth, will command a price, which will amply pay for more than the cost of removal. The city of Lynn, Mass., got a clean profit of \$2,176.25 from the composting of night soil in 1886. (San. Era, April, 1887). Minneapolis and Saint Paul waste \$50,000 worth apiece of good fertilizer each year.

As to the third class, foul water, i. e. house slops, and the liquid waste of manufactories; these go to the sewers—of course. In time, some manufactories may be required to purify their waste before emptying it into the sewers. This was frequently required in England.

As to surface water, the sewage question would be most simplified if rain water could be conducted away in separate pipes. But that seems almost impracticable in a climate like ours where pipes must be so deeply buried at so great cost. Until the time shall come when under every principal street there shall be an ample subway in which shall be accommodated all pipes for rain water, sewage, gas, condensed air, steam, and all electric wires, surface water, not escaping by the gutters and open mains, must flow into the sewers.

There remains now, the disposal of the sewage; consisting of rain water, foul water and excreta. Here there is room, not for indifference and uncertainty, but for caution and experiment. The plan must be adapted to the climate, and the topography of the city and its environs.

While experimenting with other plans it is perfectly feasible to adopt that of simple subsidence, letting effluent water, impure of course, flow into the river, and carting the sludge to a sufficient distance.

It remains to be determined by experiment whether sewage farming and intermittent filtration through soil, can be depended on where the snow lies for four months, or can be profitably practiced where the lands lie much above the outlets of the sewers. A sandy or porous soil at least, is almost a necessity to these methods.

The cities of Providence, R. I., and Worcester, Mass., after a long and careful study by their engineers of European and American experiments, have resolved to introduce a chemical precipitation sys-

tem. The Worcester plant is to cost \$300,000, and the annual expense of operating is placed at \$22,000.

In my judgment, there should be no delay on the part of our city authorities in observing the results of these New England experiments, and also of those in progress in Chicago and elsewhere, in mechanical filtration.

The ultimate disposal of sludge presents great difficulties, especially during our long and severe winters. It seems probable that some plan of drying will have to be adopted. What one, can only be decided after careful experimentation on the spot.

The plans to be tried would seem to be these:

1. Drying the whole sludge by means of filter presses, centrifugals, blowers and perhaps artificial heat.
2. Drying the whole sludge after mixture with dry earth.
3. Drying only the organic stuff caught in precipitation tanks after the subsidence of mineral matters in settling tanks. In cold weather it might be found necessary to dry this earthy sludge in order to handle it.

As to the value of our sewage sludge for fertilizing, that, too, must await the decision of experiment. Should the dry earth process of defecation be adopted, the stuff can be used over and over until it shall reach any desired degree of richness, and the sale of it would help to pay expenses. If demanded by cultivators, it could be enriched by superphosphates or other chemical manures. It is at this point that the co-operation of enterprising gardeners and fruit growers will be found indispensable.

Let me briefly recapitulate:

An inland city, like Minneapolis, has four kinds of filth to remove and dispose of:

1. Solid matter not excreta, such as sweepings, ashes, dirt, garbage, rubbish, and stable litter.

These must be collected, assorted and carted to convenient centres. Garbage and rubbish and stable litter should be burned, except such stuff as may be taken for manure. Other solids should be in demand for fertilizing and filling low grounds.

2. Rain water, to go off by open gutters and into the common sewers.

3. Excreta.

4. Foul water.

These two to the sewers.

Our four classes reduce then to two:

. Solid matter, to be cared for above ground.

. Fluid matter, to go into the sewers below ground.

The fluid sewage must be purified and deodorized, and the water run off pure enough to enter any decent river. The solid residue must be handled in such of the ways indicated above as experiment will show to be most efficient and economical.

Meantime we are in Minneapolis lavishing hundreds of thousands of dollars upon a system of sewers planned to empty the liquid filth of a great city into the Mississippi river. It may be we cannot stop here where we are, but from this instant our engineering talent should be devoted to such a modification of plans as may render the sewers we are now laying of some use in a system of the future, designed to discharge its contents at some convenient point for purification.

The city will not be allowed to discharge its filth into the Mississippi river indefinitely. Mighty as that stream is, it is not big enough to dilute and deodorize the sewage of a hundred towns and cities seated on its banks and tributaries. The national government will soon be invoked to preserve this great waterway from pollution, or if not, the riparian cities of our own State will soon be knocking at the doors of its capital for protection against the stinks and offal of the great cities.

It is none too soon to attend to the problem of caring for our own filth. We may now handle it at leisure and with composure. If we neglect it, we may be forced suddenly to adopt hasty plans, and expend millions only to find those plans unsuitable.

At the conclusion of Prof. Folwell's address, on motion, he was given a vote of thanks, and the address was referred to a special committee, consisting of Messrs. Owen, Gray and Hillman, to take suitable action thereon.

DISCUSSION.

Mr. Pearce. Mr. President, the paper read by Col. Folwell was good. This subject has been under consideration for some time past by our market gardeners. If this surplus material can be carried back to the soil where it belongs, and utilized, it will prove of great advantage, and we hope the municipal corporation of this city will take us in this grand and useful enterprise.

Mr. Harris. This was a very important subject. As soon as the people of LaCrosse began to use the water of the Mississippi river the sort of scourge broke out, and many were taken off by diph-

theria and other diseases. If Minneapolis and St. Paul were to dispose of their city cleanings by using the river for a dumping ground, they should be held liable for such conduct. He hoped some action would be taken to prevent this, from the very source of the river itself to where it empties into the sea.

Mr. Underwood said he had occasion with a small party to take passage in a boat in the summer from St. Paul, and to proceed down the river as far as Lake City. The amount of sediment and offal observed on the occasion was something he had not dreamed of. He thought something should be done to prevent the father of waters from being polluted in that manner, and used to drain the sewers of these large cities.

Mr. Gray said when this subject came up before the county society, one of the health officers of the city had met with them and assured them that they should have the co-operation of himself and of the city council in their effort to dispose of city garbage and getting rid of all this filth. That was the question a committee now had before them. It was hoped arrangements could be made with the railroads for removing stable manure to different points near the city where it could be used. He thought street sweepings one of the best fertilizers to be had, and the question was how to get them from the city. Some of the rubbish was of no value. There were questions in regard to this subject that required much thought and consideration in order to make any definite proposition to the city council. As a rule aldermen knew very little about the subject of city sanitation, and many of them cared very little about it, either.

Mr. Cleveland. Mr. President, this discussion has brought to my mind the method considered for the disposal of sewage in Chicago some years ago. At one time I found some members of my family were suffering, and we attributed it to the use of river water. Since living in this city I began the use of very pure water, brought in from Glenwood springs. The disease known as winter cholera; we hear of it everywhere; we had it in Chicago in the winter of 1880-1; it was an epidemic that was almost universal, and scarcely a family escaped. I hear a great deal of it here, but I have had no case of it in my family. I haven't known a family that used the spring water that have suffered with it. It occurred to me that possibly it might be the river water that caused the winter cholera.

In Chicago it is claimed the crib is so far out from the shore that no impurity from the city could reach it, but that never entirely satisfied me; I always felt nervous about the Chicago water. I suggest this

for others to consider whether it may not be the river water that is responsible for what we are suffering here this winter.

President Elliot. To give some idea of the amount of stuff we are turning into the river here, I would state that our health officer stated at the meeting referred to by Mr Gray, that the city was dumping into the river from two to seven hundred wagon loads per day.

Mr. Pearce. It means thousands and millions of dollars wasted.

President Elliot. The market gardeners do not properly estimate the value of this material that is being wasted, and see the necessity of saving it and carrying it back upon their lands. They are coming to that point rapidly. It is high time some method was devised for disposing of this material, and having it deposited on the land in proper shape.

Prof. Folwell. I would like to hear from some nurseryman of the neighborhood as to how far fertilization is necessary, and how much can be used.

Mr. Pearce. We can use seventy-five loads of manure on an acre; our market gardeners are using that quantity now of stable manure. In the vicinity of Lake Minnetonka we could use that amount per acre on a section of land. We ought to have it, and the amount of manure that could be supplied by the city of Minneapolis is inadequate to supply the demand.

Mr. Gray. We calculate to use from fifty to seventy-five tons to the acre. If we use cow manure we put on fifty tons per acre, and if we use coarser material mixed, we put on still more. It is not profitable in market gardening operations to lower that amount any one season. If we do there is a falling off in the crop produced.

President Elliot. We would like to hear from Mr. Hale, the secretary of our board of trade.

Mr. Hale. Mr. President, I guess I have got into the wrong place, but perhaps I can manage to get out. I have never been more interested in my life than by the reading of the paper just read by Col. Folwell, and for various reasons. Later on I may have occasion to speak of what I have done in my own garden.

When you come to take into account, Mr. President, that it is no longer ago than 1837 when Franklin Steele, now dead, entered the first land on the other side of the river, it is but a short time. Since that time a city has grown up here of 160,000 or 170,000 people. Every man that has come here has come with the intention to benefit his condition financially. Taking into account the shortness of the time and the object of the people in coming here, there has not been

time to do everything. But the time has now arrived, and if I am not greatly mistaken, necessity will settle the question before long, as to the sanitary condition and the course to be taken. I believe it is all wrong to adulterate the waters of this river that our neighbors of even St. Paul or below should be injured thereby. But up to this time there has been no way to avoid it. I believe that all the manure of whatever kind can be used within a circuit of a few miles around this city, to very great profit, and the city be benefitted thereby in every respect. Of course the first consideration is that of public health.

Mr. Cleveland has referred to winter cholera. I would state that my wife is a very particular person; she believes the freezing of water purifies it to a certain extent, and she uses no tea or coffee except from melted ice. I can't exactly see how it has any effect, but she still insists that it is the best way and I do not object to it. She would have her way, you know, anyhow, Colonel, and I am glad I am not alone, [Laughter.] This is true, however, there has been no member of our family afflicted with the disease this winter; there may be something in it.

In regard to fertilizing a garden I have had some experience, as I have a small one. You may have been by it several times.

President Elliot. It is a good one.

Mr. Hale. I do know that I never had success in gardening in the past ten or fifteen years without manure. The great trouble with the people in this northwestern country is they try to get over four times as much ground as they can take care of properly. The profits of the farmer would be increased vastly if a great deal more manure were used per acre.

I have three-eighths of an acre in my garden and the buildings occupy a portion, but I raise more garden vegetables of all kinds on the portion devoted to that purpose—three or four times as much as my family consumes. Every year my milkman draws me three or four loads of manure which is used on the land. One year it was a little too heavy and not thoroughly mixed. But the point I am driving at is that the fertilizing material of this city can be profitably used in the surrounding country here and our citizens and the farmers mutually benefitted.

I have been interested in and gratified to see the agitation in regard to this matter by the local society here; I hope the question will be pressed and some means devised for the disposition of all this waste material. I believe in thoroughly manuring the soil. I never had

much success in farming unless I put into the soil a little more than I took out.

Mr. Pearce. Market gardeners are many of them beyond the reach of this manure and it is necessary that it be taken to the country by the cars.

Mr. Hale cited the instance at Chicago, in the vicinity of the stock-yards, where the offal was disposed of in that manner and taken considerable distance.

Mr. Pearce thought there was no great obstacle in the way of the removal of this material in that manner.

Mr. Hale. The various railways could remove it to the different sections of country where most needed; they would doubtless haul it at a nominal rate.

Mr. Pearce said this was an important matter. If market gardeners were to supply the demand for vegetables in the city they should take steps to obtain the necessary material to fertilize their lands properly.

Mr. Cleveland. Mr. President, nearly forty years ago I was engaged in fruit raising and market gardening on the Delaware river, some twenty miles above Philadelphia. I was then a pretty active member of the Pennsylvania and New Jersey horticultural societies, and this question we are discussing to-night used to come up very often. We were very anxious, many of us, for a proper solution of the question. There were various companies started. I remember a certain professor in New York City recommended an article called "Poudrette," and there were companies formed in different cities for utilizing the garbage of cities. I do not know whether it is still manufactured or not. It used to be made very extensively. We used to get stable manure from Philadelphia, which was brought up on sloops, and landed on the banks of the river. A good many farmers used "Poudrette," and it was but a short time until it was such miserable stuff it was scarcely good for anything. The genuine article was valuable as a manure; but there are people who, if they can buy a sham article that is a little cheaper, will get it and think that is economy. But I know I preferred a sloop load of Philadelphia manure to all of that stuff they could bring me.

On motion, the meeting then adjourned.

MORNING SESSION.

THIRD DAY, THURSDAY, JAN. 19, 1888.

The meeting was called to order at 9 o'clock by President Elliot.

Mr. Cleveland was given an opportunity to address the Society at this time and came forward and said:

THE AMERICAN POMOLOGICAL SOCIETY

Mr. Cleveland, Mr. President, I was asked by your Secretary last evening if I was connected by the Pomological Congress, and I made reply that I took an active part in the convention when that congress was formed, and I was asked to give to-day some reminiscences of it.

I am sorry to say that while I had in my possession all the reports and published accounts of the convention at which that congress was first organized, they were all destroyed in the Chicago fire, when my office was burned and everything in it. So that all that I can tell you of it is from my own memory. I was at that time corresponding secretary of the New Jersey Horticultural Society, and was taking a very active part in horticultural matters, and I was sent as a delegate from New Jersey to New York, to meet delegates from the Massachusetts, the Pennsylvania and other horticultural societies, with a view to the organization of a national pomological congress. We had a very interesting session in New York. I think that was in 1848.

I remember there were a great many of the leading pomologists of the country present at that time. We elected Marshall P. Wilder president, and he continued the president of the congress till his death, only a year or two ago; he was re-elected time after time.

Mr. Sam Walker, who was afterwards president of the Massachusetts Horticultural Society, took a very active part in the proceedings; also Caleb Cook and A. J. Downing, Mr. Ernst, of Cincinnati, and Mr. Patrick Barry, of New York. Mr. Barry was the secretary, and the Pomological Congress was then organized, and held several subsequent meetings at Philadelphia and elsewhere. I attended regularly and with a great deal of interest, and always considered their work very valuable.

Mr. Wilder was the best manager of a public meeting that I have ever known, perfectly firm, frank and straightforward, in all respects, securing the respect and good will of all who listened to him; a man

of a remarkable combination of character, genial and pleasant. The last time I met him was in Chicago, when some six or eight years ago the pomological convention met there. I had not attended their meetings for a number of years, as they were held in the east and I was then fixed at Chicago; but I spent the day with him and met some of my old friends. I had been engaged in laying out parks in Chicago for some years then, and of course took a great deal of interest in showing my old friends what I had been doing there, and they rode around with me and we spent the day together, and had a very pleasant banquet in the evening, which was attended by the merchants of Chicago.

In 1882 I was invited to read an address on forestry to a committee of the Massachusetts legislature. A petition had been sent to the legislature for an experimental forest, under the auspices of the state, and the committee to whom it was referred invited me to read a paper on the subject, which I did. Afterwards the Illinois department of agriculture asked for it to be published in their transactions; I sent them a copy and they published it. And I sent copies of the pamphlet to different friends, and among them one to Mr. Wilder. He sent me the following characteristic letter in reply which I want to read to you. It was the last communication I had from him; here it is:

LETTER FROM MARSHALL P. WILDER.

DORCHESTER, July 4, 1882.

"Thanks, my old friend, for your excellent document on native forests. It is a capital paper. Go on with the good work; it will be a blessing to future generations. Received horticultural documents.

Yours as ever,

MARSHALL P. WILDER."

As I say, the Illinois department published this pamphlet. I have given them away as opportunity has offered. I don't like to give them where they are not appreciated, for I don't approve of "casting pearls before swine," but I felt so sure they would be appreciated here that I brought a lot of them, and which I beg that the gentlemen present will help themselves to if they care to take them home.

President Elliot. This is very interesting to me, especially, as I have had the privilege of meeting Marshall P. Wilder at several of these pomological conventions. This incident brings up many memories in my own mind of a pleasing nature. We hardly realize the great loss the country sustained in the death of Marshall P. Wilder,

but he had done a good work, and he has left a monument after him, surely, that will remain with the American people for ages.

Mr. Harris. Mr. President, I think we can all say that the work of Marshall P. Wilder did not die with him. I believe all over this North America there are thousands of men whom he educated in horticultural pursuits and who gained inspiration from the life and example of Marshall P. Wilder and a love for the cause he adorned. For myself, I can say he was a man who for over thirty years I looked up to as one worthy of emulation, and I feel that we have had no superior in this country in this field which he occupied. He had thousands of friends, and I hope we will keep his memory green in all our horticultural meetings while we live, and that those who come after us may partake in a large degree of the same inspiration.

Mr. Wilcox. Mr. President, I wish to add one word to what has been said concerning the memory of the venerable Marshall P. Wilder. It is a cause of the greatest discouragement to our younger members, and to practical horticulturists of the present generation, when we look at the many chairs left vacant and to be filled, by the death of distinguished pomologists of this country; and among the greatest of these was Marshall P. Wilder. Now, gentlemen, we have one consolation, and that is that the study and the love of horticulture is very much like some diseases, in that it clings till death. Where can we find a man with a name who has once been really interested in this work, and who has once devoted his thoughts and study to the promotion of horticulture that ever left it until his voice was stilled in death?

We have seen this illustrated in the case of such men as the Downings, Mr. Wilder and others, and we have among us now such men as T. T. Lyon, of Michigan, those who are devoting their life work to the interests of horticulture. One characteristic about Marshall P. Wilder was, while there were those that were intimate with him and knew him best could not see the brilliant genius that distinguished some men, still there was that invisible influence about him that no one could meet him without being attracted, and leaving him to remember and admire him forever afterwards.

Mr. Cleveland. What the gentleman has just remarked upon the influence of horticulture reminds me of an anecdote, which I trust will prove sufficiently interesting to pardon my using it. On one occasion I went from New Jersey with a delegation to attend the great triennial meeting of the Massachusetts Horticultural Society, by invitation. The gentlemen who went with me were strangers in Mas-

sachusetts, and as that was my old home I took them to show them what was most interesting in the vicinity of Boston, in connection with every specialty, and among other places I took them to the garden of old Samuel G. Perkins, a brother of Col. Perkins, a man of large fortune, and who has been many years retired from business, devoting himself most zealously to horticulture. We found him past eighty years old and nearly blind, seated on a camp stool in his garden pruning his pear trees, and guiding himself along where to cut by feeling. He could tell a fruit bud from a leaf bud by feeling; and on some of my friends blaming him and expressing their gratification at seeing such self-interest in the cause at such an age, he made a remark that has clung to me ever since, and of which I am reminded by what you have just said:

“Gentlemen, the love of gardening has this advantage over any other taste, that it forces a man to labor as long as he lives; and labor, gentlemen, is the greatest blessing God ever gave to man.”

Col. Stevens was here requested to read a paper prepared by him upon Indian foods:

WILD FOOD.

By Col. J. H. Stevens, Minneapolis.

Mr. President, Ladies and Gentlemen:

I am requested to hand down to this generation the varieties of the primitive or wild food incident to this soil and climate from which the Indians used in part to subsist on.

The lamented Philander Prescott, who was so brutally killed by the Indians on the nineteenth day of August, 1862, informed me in 1849 that when he came to the Northwest in 1819 the natives depended much on this wild food. In most instances it was easily gathered, and I found that while among the Indians in an early day, that even a white man would soon become fond of the wild sweet potato and one or two other varieties of the wild tubers the squaws used to serve up to us.

According to Mr. Prescott the most prominent varieties of wild product used by the Indians were the mendo or wild sweet potato, yessenah or wild prairie turnip, panhe or artichoke, omenechak or wild beans, psen-chin-chah or swamp potato, pesich-ah, towahapa or wild rice.

The mendo, or wild sweet potato, is found throughout the valleys of the Mississippi, Minnesota, and other streams in the central part of

Minnesota. It grows about the bases of bluffs, in rather moist but soft and rich ground. The plants resemble the sweet potato, and the root is similar in taste and growth. In a letter to Hon. Thos. Ewank, dated Nov. 10, 1849, a copy of which I have in my possession, Mr. Prescott says: "It does not grow so large nor so long as the cultivated sweet potato, but I should have thought it the same were it not that the wild potato is not affected by the frost." The Indians simply boiled them in water when being prepared for the table. I have intended to have made experiments in the cultivation of the mendo, believing they would bear civilization, and perhaps when perfected a new variety of sweet potato of great value would be added to our products. I regret much my negligence in this matter.

The tip-sne-ah, or wild prairie turnip, grows on the high native prairies, one or two together, in size from a small hen's egg to that of a goose egg, and of the same form. They have a thick black or brown bark, but are nearly pure white inside, with very little moisture. They grow about six or eight inches below the surface, and the Indian women used to dig them with a sharp pointed stick forced into the ground and used as a lever. They were boiled and used by the Indians in the same manner we use our turnips. They were frequently split open and dried for winter use by the squaws. When dried they resembled chalk. Mr. Prescott thought that when thus dried they could be ground into flour and that they made a very palatable bread. The pang-he, or artichoke, grows where the land is rich, near fallen or decayed timber. It was only used for food when the Indians were very hungry. The Omen-chah or wild bean was found in all parts of the valleys in the old territory where the land was moist and rich. In regard to this plant Mr. Prescott says: "It is of the size of a large bean, with a rich and very pleasant flavor. When used in a stew, I have thought them superior to any garden vegetable I had ever tasted."

The Indians were very fond of them, and pigeons get fat on the product in the spring. The plant is a slender vine, from two to four feet in height, with small pods two to four inches high—with small pods two to three inches long, containing from three to five beans. The pod dries and opens, the beans fall to the ground, and in the spring take root and grow again." There is no question in my opinion but what this plant could be successfully cultivated and civilized.

The psen-chin-chah, or swamp potato, was found—and I suppose it is so to this day—in the mud and water about three feet deep. The leaf is as large as the cabbage leaf. The stem has but one leaf, which has, as it were, two horns or points. The root is obtained by the

Indian women; they wade in the water and gather the roots. It is of oblong shape, of a whitish yellow, with a few black rings around it, of a slightly pungent taste, and not disagreeable when eaten with salt or meat.

The psen-chah I believe to be of the same family as the last but the tuber not so large. The stem and leaf are similar, but grow in deeper water. The Indians are very fond of them. Both of these tubers are found in large quantities in the muskrat lodges, stored by them for winter use. It is not saying too much to call them a luxury.

The ta-wah-pah is another tuber, or rather a root, that the Indians esteem highly as food. Like the two preceding, it is a water product. The stem, leaf, and a yellow flower is like the pond lily. It is found in the lakes, in water and mud from four to five feet deep. The Indian women used to gather them in large quantities. The root is from one to two feet in length, very rough; there are as many as six or eight cells running the whole length of the root. It is slightly sweet and glutinous. The Indians generally boiled it with wild fowl, but often roasted it in the absence of wild game. All of these roots were preserved by the Indians for winter use, by boiling and then drying them over the fire, or in the sun.

The greatest product of all was the wild rice, at least as an article of food, of which the Indians themselves gathered instead of the women. They used it in all of their great feasts. It was found—and I suppose it is to this day—in lakes and streams, where the mud and water is from three or four feet deep upwards to ten or fifteen. The rice harvest was a short one. It was only of a week's duration. When ripe the slightest touch shakes it off, a strong wind of short duration scatters it in the water. The Indians obtained it by paddling a canoe among the rice, when with a hooked stick they drew the stalks over the canoe and whipped off the grains. They continued to push the canoe on and whipped off the rice until the canoe was full, then carried the cargo to the shore, unload, fill again until the season was ended.

To dry the rice they erected scaffolds about four feet high, eight wide and twenty to fifty feet long, covered with reed grass. On these the rice was placed and dried by a slow fire kindled under the scaffold and kept burning about a day and a half. The beard is longer than that of rye, and to remove it and the chaff the Indians made a hole in the earth about one foot wide and one foot deep, in which they placed a skin, and put about a peck of the dried rice at a time in the hole. Then the Indian, holding himself by a stake planted

near, stamped off the heads. It is then cleaned and stored for future use. It is of a dark color, and many of the pioneers prefer it to the California rice. I never did, but frequently in an early day was obliged to eat it or go hungry.

I do not pretend to give the botanical name to these products. I prefer to let them remain in their own native Dakota, just as Mr. Prescott left them so many years ago.

On motion, a vote of thanks was given Col. Stevens, with the request of a copy for publication.

The following paper was read by Mr. Owen, editor of *Farm, Stock and Home*:

FORESTS AND MINES.

THE RELATION OF OUR UNDEVELOPED IRON AND COAL MINES TO OUR OVERDEVELOPED FORESTS.

By S. M. Owen, Minneapolis.

Mr. President, Ladies and Gentlemen.

This country has now reached a period of intellectual and material development so advanced that new problems are constantly presenting themselves, as new scenes present themselves to the traveler in a strange country. As a nation we have driven such a furious race behind the spirited steeds of progress that we have forgotten everything save the exhilarating sensation of our rapid ride; have been oblivious to the terrific strain to which carriage, steeds and rider have been subjected; have been indifferent to a possibly useless waste of energy and misuse of resources. We have been forgetful of the past and thoughtless for the future. If we feel any gratitude toward our ancestors, the sentiment is not powerful enough to properly impress us with our obligations to posterity.

This unwise, even dangerous, indifference of the present regarding the future is manifest in a thousand ways, but it is my purpose to call your attention to but one of them, though that one is by far the most important of all, for it is one that is leaving in its wake the most of danger and calamity; I allude to the destruction of the forests of our country.

I do not propose to touch upon the climatology of this subject. I

assume that every one of you know how important a factor that is in the forestry problem; but if anyone of you do not, I am certain you have those among you who can discuss that phase of the subject more intelligently than I can. I will not stop here even to discuss the governmental absurdity of giving timber destroyers an immense bounty for demolishing the great forests which temper the north winds to our suffering fields and fruits, while at the same time it gives liberally for planting trees to modify the winds from the west!

My purpose is to give some well authenticated statistics of the present condition of our forests, the rate at which they are being destroyed, their probable duration if the present rate of destruction is maintained, and to suggest means of supplementing them with other resources. It does, indeed, seem incredible that this country, yet in its infancy—as the lives of nations are estimated—and which was endowed with a wealth of timber regarded as absolutely inexhaustible, should enter the front door of the second century of its life to be there confronted with the most melancholy of all problems, that of an insufficient timber supply—a timber area so narrowed that processions of climatic calamities are almost constantly on the march by reason of the narrowness. But however incredible this may seem it is not the less true; shut our eyes to the fact as we may, or sing never so sweetly our bounty-paid lumber lords to the contrary, the present condition of our forests is deplorable. The insufficiency of our timber supply is already appalling, and daily growing more so, because—paradoxical as it may seem—parsimony and extravagance are running a joint race of devastation and waste!

The figures which I am about to present for your consideration are authentic and reliable, and I would have no one consider them as the emanations of an alarmist's brain, or unworthy of attention. It is said that our Western and Northwestern mills have in forty years destroyed the timber that it took two hundred years to grow. The capacity of the present mills in the South is sufficient to exhaust the valuable timber in that region in twenty-five years, and it would take from one hundred and fifty to two hundred years of intelligent timber culture to renew the probable destruction of the next twenty-five years. There are yet enormous belts of timber on the Pacific coast, yet careful calculations have demonstrated that when that supply is drawn upon for the nation's needs—as it soon must be if something is not done to check the present frightful consumption and reckless waste—it cannot possibly last over fifty years.

It requires a serious contemplation of the almost inconceivable con-

sumption of timber in this country to enable us to be incredulous regarding its claimed insufficiency. If your minds can grasp the following figures, you will be better able to appreciate the forestry situation. Careful estimates, based on the most laborious and painstaking research of the forestry division of the national department of agriculture, place the annual consumption of timber at 20,000,000,000 cubic feet—240,000,000,000 feet of lumber; or, if we now number 60,000,000 people, 4,000 feet for each man, woman and child in the land. This amount is made up as follows:

For lumber market and wood manufactures, 2,500,000,000 cubic feet; railroad construction (new construction, based on the average of the past ten years), 360,000,000 cubic feet; charcoal, 250,000,000 cubic feet; fence material, 500,000,000 cubic feet; fuel, 17,500,000,000 cubic feet.

These amounts are actually used, but they do not comprise the total of forest depletion; for our wasteful practices, culling and thinning forests (leaving the residue to die), and conflagrations, add from twenty-five to fifty per cent to the already enormous total. It is known that the carefully protected and intelligently cultured forests of Germany make an annual growth of fifty cubic feet per acre. If our forests were making a corresponding growth—which no intelligent forester will admit—on the basis of the lowest estimate of loss by waste and fire, it would take the growth of 500,000,000 acres to keep pace with our consumption.

Four years ago a careful canvass was made to determine the forest area of the United States. Including the previously mentioned Pacific coast belts, and the vast timbered regions of Alaska, we have a total of only 489,280,000 acres. It is unsafe to estimate the annual growth of our forests at over one-half those of Germany, of twenty-five per cent; and it is certainly not unreasonable to put the loss by waste and fire at thirty-five per cent—less than an average of the various estimates. This gives a total consumption of twenty-seven billion cubic feet, and an annual growth of only 12,231,000,000 cubic feet! Appalling as these figures are, they do not tell the whole story, for it is admitted that many of the above estimated forest lands do not possess a foot of valuable timber—are but swamps of brush, hill-tops of scrubs, and worthless second growths on former timber lands.

It is my candid opinion that the citizens of the United States never were confronted with a more serious problem than the one now under consideration. They never were confronted with a problem which

demanding more intelligent or more radical treatment, nor one fraught with more importance to the future dwellers of this land, which God made so fair and endowed so richly.

In what direction does duty lie, must be our first thought; that point settled, duty's paths must be trodden persistently and uncompromisingly. No consideration of a public or private nature must be considered paramount to this one. Investigation will reveal the fact that this question is provided with two duty paths; one is the planting of timber, the other is the preservation of that which we yet possess. Concerning the importance of the first duty we are all agreed; though it must be admitted that we have not pursued this path with the energy, ability, nor to the extent that the exigencies of the case demanded. Tree planting in this country is as yet but a vaguely defined sentiment. In many localities, on many farms, this sentiment has crystalized into fair timber belts and thrifty groves; these are, however, but drops in the vast ocean of desolation which has washed over and well nigh obliterated our once magnificent forests.

But I do not propose to discuss this end of the subject. Change the sentiment of tree culture, if you will, into a great intelligently organized fact; make it a government work of unparalleled magnitude and efficiency, and yet that will be following but one of the paths of duty to which I have alluded.

Let us now consider the matter of stopping the unnecessary consumption and preventing needless waste. Right here allow me to say that governmental forest planting co-existent with government encouragement of forest destruction, is a bung hole waste and a spigot saving policy so idiotic that our posterity will be amply justified in derisively laughing at our folly; and it is a policy that cannot be changed too quickly.

If we have any resources which can be made to supplement the one of timber, we should surely hasten to utilize them; if we have any reinforcements which can aid our forests in holding their own against the vandalism which is now so rapidly destroying them, we should not hesitate a moment about enlisting them in the holy cause. The reinforcements are at hand; we possess them in untold quantities, and they are marvelously easy of access; these great resources are coal and iron.

We are burning 17,500,000,000 cubic feet of our precious forests every year. At the same time we possess two-thirds of the known coal of the world, but it is so hemmed about by unnatural trade laws, and so dominated and controlled by capitalistic combinations that it is

made one of the luxuries of life, bearing a higher price than in any other country of the globe, and hence enormously and unnecessarily augmenting the consumption of wood. I will not waste words on this branch of the subject; I feel that it would be an insult to your intelligence to enlarge upon so palpable an absurdity. Of iron and its possibilities as a timber-saver I must have more to say. First, allow me to quote so much of the report of the United States commissioner to the last International Exposition held in Paris, as refers to our natural wealth of coal and iron. It so tersely calls the roll of the reinforcements I am now considering that I think it can but interest you.

Along the Atlantic slope, in the highland range from the borders of the Hudson to the State of Georgia, a distance of one thousand miles, is found the great magnetic range, traversing seven States in its length and course. Parallel with this, in the great limestone valley which lies along the margin of the coal fields, are the brown hematites, in such quantities at some points, especially in Virginia, Tennessee and Alabama, as fairly to stagger the imagination. And, finally, in the coal basin, is a stratum of fossiliferous ore, beginning in a comparatively thin seam in the State of New York, and terminating in the State of Alabama, in a bed fifteen feet in thickness, over which a horseman may ride for more than one hundred miles. Beneath this bed, but still above the water level, are to be found the coal seams, exposed upon mountain sides, whose flanks are covered with magnificent timber, which can be used for the purpose of manufacturing charcoal iron. Passing westward, in Arkansas and Missouri, is reached that wonderful range of red oxide of iron, which, in mountains rising hundreds of feet above the surface, or in beds beneath the soil, culminates at Lake Superior in deposits of ore which excite the wonder of all beholders; and returning thence to the Atlantic slope, in the Adirondacks of New York is a vast undeveloped region, watered by rivers whose beds are of iron, and traversed by mountains whose foundations are laid upon the same material; while in and among the coal beds themselves are found scattered but rich deposits of hematite and fossiliferous ores, which by their close proximity to coal and a market makes possible the development of an iron industry such as the world never saw. From these vast treasures the world might draw its supplies for centuries to come, and with these the inquirer may rest contented, without further question; for all the coal of the rest of the world might be deposited within this iron rim, and its square miles would not occupy one-quarter of the coal area of the United States.

In very truth it may be said that iron and coal are almost as plenty in this country as dirt! They are almost as boundless as "the empty, vast and wandering air." We have all the materials for iron making in conjunction, and all of them above water level! From their beds they can be carried by their own gravity to the smelting furnaces and rolling mills. In no other country on earth do such conditions prevail; in no other country do they even remotely approximate them! This certainly means that iron can be easily and profitably produced in the United States at a lower price than in any other country, for in all other countries materials must be mined from great depths and brought together from long distances.

Now, with cheap iron given us, what will we do with it, how make make it supplement timber, and lessen the consumption of wood? I answer, in a thousand ways! But I will call your attention to but a few. One of our most remorseless timber destroying agents is the railroad. The timber it uses is of the very best. The element it takes from the forests is analagous to the youth of a nation. The prime, sturdiest, most promising representatives of the forest are sacrificed to the demands of the railroad. Whether for ties, bridges, culverts or cars, nothing but the freshest, purest blood of the fast disappearing aristocracy of trees will satisfy the appetite of the railroad giant. Five hundred and ten million cubic feet of such timber is used annually for ties, bridges and telegraph poles alone. Estimating the annual growths of our forests at forty cubic feet an acre, it takes the growth of 12,750,000 acres to provide for these three items, *and every cubic foot of them should be iron!*

Iron bridges and culverts for railroads should be made compulsory by law. The *London Daily News*, in commenting on that terrible disaster at Chataworth, last summer, said: "And the strangest thing about this strange, sad accident, is that the culvert was made of wood." Strange, indeed, must it have seemed to an intelligent Englishman; and it should be made impossible by intelligent Americans!

The iron railroad tie is no longer an experiment. It has been in use in Europe for twenty years, and substitution of iron for wooden ties is now being made there with marvelous rapidity. In Germany, Switzerland and Holland one eighth of the entire railroad mileage was supplied with iron ties as long ago as 1884. At the present time the percentage is much larger, and is rapidly growing. Even in sleepy old Mexico, on one railroad alone from forty to fifty thousand iron ties are being put in every year. This substitution of iron for wood is done in the interest of economy; but this interest does

not obtain in this country, because of the economic anomaly existing here of a scarcity of timber at a low price and a plethora of iron at a high price. Does it not behoove the lovers of trees, and those who are considerate of posterity, to do what they can to destroy such an economic anomaly?

England mines her coal from narrow seams deep in the bowels of the earth; is compelled to import more ore than she mines, to enable her to make the kind of iron and steel the world wants, and is selling ties to Holland, Switzerland and Mexico, while the United States goes on remorselessly devastating her forests, because the price of her iron is too high to be substituted for wood! Instead of the highest, we should have the lowest priced iron in the world. Then we could not only have railroad ties of iron, but bridges, culverts, telegraph poles, cars and depots of the same material. We could have iron wagon bridges and culverts; our homes might be shingled with iron; our corn cribs and granaries built of iron; and these great buildings which we see going up around us every day of massive brick and stone walls, but great lumber yards for interiors, would be more cheaply built, and infinitely more permanent and safe if iron were used instead of wood. We should be living in a golden age of iron, dominating and controlling the world's markets, instead of blindly ignoring the great wealth at our feet, and constantly looking up to estimate the market value of every noble tree our eyes light upon.

Now, ladies and gentlemen of the Minnesota Horticultural Society, let me say in conclusion, that this question is one that must not be looked at from the standpoint of partisan prejudice, nor of past or present predilections. It is a new question; it has a significance now it did not have when forests were believed to be inexhaustible. The relation of forests to mines has become so close that one cannot be intelligently discussed or treated without considering the other. As our duty to God and our children is above every other duty, so is this question above party creed or party allegiance.

I have presented these facts to you because you are the conservators of the forestry interests of your section of country. My object is to point you towards a means of protecting and preserving your ward, which possibly may not have occurred to you. I trust you will see it as I do; I hope you will not ignore the points I have made simply because they may seem Eutopian at the first glance, or impossible of realization. I desire you to first ask yourselves if the points are right, if they are reasonable; and if you decide them to be so, and do what you can to so mold legislation that the desired end will be attained

you will be conscious of having done your duty; and whether you succeed or not, you may be assured that posterity will not forget to bless you for the efforts you made to bequeath to it the priceless blessing of thrifty and sufficient forests.

The intelligent conservatism of this Society is known and acknowledged all over the land; and if it should start a discussion of the forestry problem from a standpoint similar to the one I have but imperfectly outlined, I feel satisfied that it would go a long way towards inaugurating a crusade for economic and commercial methods that would eventually prove of inestimable value, not only to our forests, but to our industrial system. It is not necessary for me to suggest to this body the danger of a fanatical or dogmatical agitation of this question. If he whose cause is just is thrice armed, then you have weapons in your hands so potent that calm reason is the power to wield them, and not fiery fanaticism.

In pursuing the present policy we are, I feel satisfied, committing a great wrong against ourselves and a great crime against posterity. The wrong must be righted and the crime must be stopped. Some day the war for the right will be waged on this line. It is none too soon to declare the war, nor is there a more appropriate place to declare it than in this region, where the first and greatest suffering will be experienced, for here we will have the fewest forest trees, yet will have the greatest need of them.

DISCUSSION.

Mr. Sias. Mr. President, I move that we place this most excellent paper on file, and the author be tendered a vote of thanks, and also request its publication in the *Farm, Stock and Home*, and that members of this Society be furnished with copies.

Col. Robertson. Mr. President, I am glad to be here, and to have an opportunity to listen to this paper. It is one of great importance. I have read much, studied, and inquired much concerning this subject, and I must say it is the best presentation of it I have ever heard, the most complete of anything of which I have any knowledge. It is enough to distinguish the gentleman who is the author of it, and it is a credit to our State. We are not happy hyperboreans here, but as he has characterized us, we are the finest body of men in the world intellectually and physically. But it is time, as shown by this document, that we will be compelled to leave this country, or our children after us—we cannot live here—we might as well go to Greenland or Ice

land to live—unless we become interested in forestry and plant trees to protect the people. We ought to have a thousand copies of this paper published immediately, and it ought to be distributed widely. We must commence this work of national defense. The war of the rebellion and all other wars possible cannot do the damage that this work is now doing, in order to satisfy the avarice and greed of men, and in consequence of their ignorance, at least many of them. I want a hundred copies of this myself, and I will send them to scientific men throughout Europe, and those who are interested in forestry generally.

Col. Stevens said he hoped the motion would be adopted, as the paper was a valuable one.

Mr. Harris moved to amend the motion by authorizing one thousand extra copies of the paper to be published at the expense of the Society, not exceeding twenty-five dollars. The motion was carried.

Mr. Thompson said he would order a hundred copies for distribution in Iowa.

Col. Stevens. Mr. President, we have an honored member among us in the person of Col. Robertson, who for many years has been traveling in Europe for the purpose of gaining information in regard to agricultural matters and everything pertaining to the benefit of mankind. He is our first president of this Society, and I should like very much to hear from him as to his explorations in Europe.

Col. Robertson. Mr. President, I will not take your time with any remarks, but I may say here that I was requested by your Secretary to prepare a paper upon climatology and other kindred topics. I received his letter while traveling in Northern Europe, and was so occupied at the time that the matter was neglected. But the subject is one of great interest to me, and it will afford me great pleasure to prepare a short paper for publication on the topic of economic climatology for Minnesota.



SECRETARY'S ANNUAL REPORT.

Mr. President and Fellow Members :

I have the honor for the third time to present herewith my annual report. We are to be congratulated upon the most auspicious circumstances under which we meet as a Society on this our twenty-first anniversary. Some of the earnest band of workers in the horticultural field, who helped to do foundation work in Minnesota, are with us still to-day. That unanimity of purpose, as well as harmony of action, which in a marked degree have characterized all the Society's transactions in the past, are yet preserved; and notwithstanding obstacles that may perhaps have been encountered heretofore, there is abundant cause for satisfaction at the progress made.

Permit me here to add with that illustrious pomologist, the late Marshall P. Wilder, in his unique address before the American Pomological Society at Boston, in 1881, when he said: "Happy, most happy am I to join hands with some who aided in the establishment of our institution; who rocked the cradle of its infancy and still survive to rejoice in its progress and usefulness."

In looking back upon the record made in twenty years or more in horticultural work and progress in our North Star State, we find a wondrous field for study and reflection. Some most important lessons have been taught us in the past, from which we should glean wisdom for the future and seek to profit from the same in days to come.

COMMERCIAL HORTICULTURE.

It has been said, "It is no royal road that leads on to fortune;" and that is true, at least on horticultural grounds. In growing fruit there must be neither lack of perseverance, watchfulness nor care; and one must be prepared to overcome most serious obstacles, and only hope to be successful on legitimate lines, no matter how much zeal or skill may be expended when once the object sought to be attained is known to be impracticable and vain. It is unreasonable, for instance, to expect that Minnesota should compete successfully in raising fruit with California, that "horticultural paradise," as it is often called, at least in a commercial way. That state claims greater adapt-

ability to growing fruits of every kind than almost any other clime, and hence the industry is rapidly upon the increase; extravagant reports are given concerning average yields of fruit and prices realized.

RAPID TRANSIT.

One thing that should be borne in mind in this connection is the fact that, by the use of good refrigerator cars, these California fruits are readily transported and brought in competition with the products raised in other states and sections further east. As is well known, in Illinois, Michigan, and other fruit producing states some growers are becoming more or less alarmed at the enormous shipments being made, lest home-grown fruits should be displaced and local markets overstocked.

INCREASE OF SHIPMENTS.

It seems these fruits from the Pacific coast are finding ready sale. Our local dealers and commission men in Minneapolis and St. Paul, who first began a year or so ago to handle western fruits in bulk, received this season several hundred cars of California fruits. In view of these conditions the question seems to be presented what method should be used to meet this competition, what line of action ought to be pursued to bring about the best results for all concerned?

MEANS AND METHODS.

It generally is a waste of time and poor economy to try to grow that which will come in competition with products from more highly favored localities. The prudent farmer, fruit grower, and market gardener as well, will count the cost to see what he can raise to best advantage. Choice products generally command the highest price; and therefore it will always pay to raise the *very best*. Then, too, with thorough cultivation a better and larger yield will be secured.

By studying markets carefully, the nature of the climate, soil, exposure, cost of marketing, and the like, a better understanding can be had of what to grow and when and how to sell the product raised. Results will be more satisfactory by far than carrying on the enterprise, or industry pursued, in the old-fashioned, haphazard kind of style.

HOME GROWN FRUITS.

But after all that may be said in favor of commercial horticulture in

this State, our main dependence, or rather what is wanted most, it seems to us, is some awakening among the masses as to the importance of providing liberal supplies of home grown fruits.

We wish to emphasize this point. There is no wisdom in the farmer bending all his energies at raising wheat and totally neglecting the "plum thicket" and the strawberry "patch." In nine times out of ten the farmer who neglects to grow sufficient fruit for home and family use because it "costs" too much, will go without this almost priceless blessing, which surely is within the easy reach of all. The business of raising home grown fruits for family use should take a new momentum right away. While there is progress in some localities in this direction quite marked and most encouraging indeed, the industry should be increased a hundred-fold throughout the State.

There is good logic in the following in a recent issue of the *Farm, Stock and Home*: "Increase the gardens and small fruits of a country and you increase the comfort and happiness of its people."

THE PAST YEAR

In some respects has been unfavorable for fruit. The drouth had been severe in several western states the previous year, and being still protracted into 1887, results were quite disastrous to the farming interests of the State. The ravages of chinch bugs were more extensive and destructive than ever known before, especially to our leading staple, wheat. The ill effects of drouth were equally as marked, we think, on fruits as on the cereals and vegetable productions. One cause of shortage in our crop of fruits lies in the further fact that many of our orchards have not yet become restored from the effects of our late trying winter; some orchards being totally destroyed. In some localities, however, there was a gratifying show of fruit. The orchards yielding well were mainly those in favorable situations and the varieties produced were of the hardier kinds.

SMALL FRUITS.

The small fruit products of the State were greatly shortened by the drouth; but this deficiency was partly counterbalanced by excellence in quality of fruit produced. Strawberries ripened earlier than usual, and quite a number of our local growers reported satisfactory yields of fruit.

Grapes seldom ever have been known to be a better or a larger crop. The dry and heated spell of weather which prevailed so long proved

very beneficial, and all the leading sorts matured their crops of fruit.

In view of all the circumstances and conditions, the season averaged fairly well.

FRUIT AT THE STATE FAIR.

At our State Fair, held last September, there was a fine exhibit made of fruits, of apples, grapes and native plums. The fruit department was very properly conducted by or under the auspices of our Society.

The well known Duchess and our favorite Wealthy took the lead in kinds of apples shown. The Okabena seedling attracted much attention, as did the fine display made by our genial friend from Steele, who, by the way, secured the lion's share of premiums on the larger fruits.

The grapes exhibited were large and very fine, and numerous varieties were shown. Mr. Latham, our champion grower at Excelsior, was awarded first premium on Delaware, Concord, Moore's Early, Iona, Duchess, Roger's No. 4 and Telegraph; and second on the Janesville, Roger's No. 39, Lady, Brighton and ten best kinds for Minnesota.

Mr. Knapheide of Ramsey county, received first premium on the best ten varieties adapted to Minnesota. He made a fine display of seedling grapes. Some eight years since he sowed a quantity of mixed grape seed and obtained therefrom a number of quite promising varieties which have been bearing for some time, the fruit of which has not before been shown. No names have yet been given these varieties, they being known by numbers only. When fully tested and proven to be valuable, they will be given names. He states that No. 1 is not considered healthy, it being subject heretofore to mildew; No. 5, a small variety, slow grower, healthy, and a good bearer, is very early. Nos. 6 and 7 are healthy, prolific and good growers.

There were quite numerous entries made as well as premiums awarded, and the display in general was creditable indeed. Much praise is due the superintendent, our worthy President, for the attractive way in which exhibits were arranged to show their merits to the best advantage.

FRUIT AT ROCHESTER FAIR.

There also was a creditable exhibit made of fruit at Rochester, at the fair held by the Southern Minnesota Fair Association, it being mostly

own by local growers thereabouts. Mr. Sias, of Rochester, exhibited some twenty kinds of evergreens. Mr. Somerville, of Viola, who exhibited some twenty-seven varieties of apples, and mostly of new Russian sorts, received the larger share of premiums awarded.

SOME STATISTICS.

Census reports give the value of orchard products in the United States as follows: 1850, \$7,723,186; 1860, \$19,991,885; 1870, \$47,518,900, (gold value about \$38,000,000); 1880, \$50,876,154. For the year 1886, apples, \$50,400,000; pears, \$14,130,000; peaches, \$56,135,000; grapes, \$2,118,900; strawberries, \$5,000,000; other fruits, \$10,280,000.

As indicating the importance of the fruit interest it may be stated that California alone has more than seventy-five thousand acres in vineyards. Seven thousand crates of strawberries, or ten thousand bushels have been received in the New York market in a single day. Between seven and eight million baskets of peaches were grown in Maryland and Delaware in 1875.

The progress made in fruit culture during the past twenty-five or thirty years has been marked indeed. The exports of apples from this country which were 269,000 barrels in 1861, sixteen years later were 937,025 barrels. Where a few years ago small plots of ground were occupied in this industry, we find hundreds of acres at the present time. But the demand has kept quite even pace with the supply, and the choicest fruits are no longer considered as luxuries merely but as articles of necessity within the easy reach of all.

The following statistics are given here, made up from reports of different counties in Minnesota to the Secretary of State:

Number of apple trees growing in 1886.....	474,258
Number of apple trees bearing in 1886	188,955
Number of bushels of apples grown in 1886.....	123,199
Number of apple trees growing in 1887.....	478,742
Number of apple trees bearing in 1887.....	160,926
Number of grape vines bearing in 1886.....	89,876
Number of pounds grapes produced in 1886.....	206,200
Number of grape vines in bearing in 1887.....	87,171
Number of forest trees planted in 1887 on Arbor day.....	327,130
Number of acres planted during season	3,220
Number of rods planted on highways and farms in 1887	522,837
Number of acres forest trees growing in State.....	47,431

Without commenting here at length on these statistics it may be

proper to observe, that while somewhat indefinite or unsatisfactory in some respects, they indicate some progress being made—that work is going on to some extent at least throughout the State. Of course if full and accurate returns could be obtained there would be still a larger and better showing given.

THE SOCIETY.

The progress made by the Society in 1887 is quite encouraging indeed. Our annual membership, in view of stringency in money matters, and the low prices which obtain in farm produce of every kind is well maintained. We have to-day a considerably larger list of active paying members than several other horticultural societies that might be named in other sister states. We do not say this boastfully but as indicative of interest felt in Minnesota in the advancement of the cause we seek to foster and promote.

A live society exerts a potent influence at home as well as abroad. The facts and information elicited by the discussions and proceedings at our annual gatherings, when spread upon our minutes and placed before the public in a permanent form, are found to be of special value in awakening interest in horticultural matters generally throughout the State, as well as elsewhere in a greater or less degree. We ought to strive of course to raise our standards higher year by year; to gain such facts concerning best and hardiest varieties as may prove valuable to all.

It is most gratifying to observe the great demand, especially on the part of the farming community, for our published transactions; the care with which the same are read and well preserved upon their library shelves. It should be stated here there is a marked demand of late from other states for our reports from many leading publishers, as well as from the managers of educational institutions throughout the land.

PUBLISHING REPORTS.

At our last annual meeting a change was recommended in the law regarding the publication of our reports, to increase the number of the same to five thousand copies, of which number two thousand copies should be bound in cloth. Accordingly a bill was introduced by Senator Hoard containing such provisions, similar to the present law in force, which promptly passed the senate but was not reached in time for final passage through the house.

Our present number of reports, three thousand five hundred copies,

carefully and properly distributed, is quite inadequate to meet the wants of the Society. There should be some provision for binding them in cloth. The books in paper covers are apt to go the way suggested by Secretary Gibbs in his report for 1884: "The usual way of pamphlets; first down flat on shelves around the house, dust covered, disarranged and always in the way; then up garret, and finally to the rag gatherer for a tin whistle, and when wanted for reference to help out in a difficulty in the garden or orchard, never found."

The bill referred to failing to become a law an order was obtained from Col. Mattson, secretary of state, for six hundred copies to be bound in cloth, and with three hundred copies bound at the expense of the Society, by using some economy we have done fairly well. Of course discretion must be exercised in sending out reports, as it is necessary to retain a certain quantity for future use.

VOLUME FIFTEEN.

The last volume of our transactions was issued in the month of May nearly two months earlier than the preceding year. It was a trifle larger than previous numbers and lacked but a single page of the number limited by law,—499. The typographical work was well performed, thanks to the pains-taking publishers, the Pioneer Press Printing Company, and makes a creditable appearance, especially the copies bound in cloth.

PERSONAL NOTICES.

Among the many notices received we quote the following:

CHAMPAIGN, ILL., May 14, 1887.

S. D. Hillman, Secretary, etc.:

Please accept my cordial thanks for your kindness in sending me a copy of your excellent report. I have looked it through with much interest, and am glad to see that in Minnesota as in Michigan, Illinois and many other states the science of horticulture is progressing.

Very truly yours,

CLARENCE M. WEED.

COLUMBUS HORTICULTURAL SOCIETY,

COLUMBUS, O., May 16, 1887.

S. D. Hillman, Secretary, etc.:

DEAR SIR: Copy of your report for 1887 at hand, for which accept thanks. I think you must have a live Society, from the amount of

work you are doing and the voluminous report you send out. So far as I have examined it, I find it good.

Can you not exchange with our society?

Yours truly,

H. S. DEVOL, *Secretary.*

DALLAS, TEXAS, June 1, 1887.

S. D. Hillman, Secretary, etc.:

Copy of Minnesota State Horticultural Society's report received. Please accept thanks and hearty congratulations from the Texas State Horticultural Society. We have live material in our society trying to do effective work, and we hope to be able to send you our published report ere very long.

Yours for horticultural progress,

MRS. J. R. JOHNSON,

Secy. Texas State Hort. Society.

OFFICE OF SECRETARY, INDIANA HORTICULTURAL SOCIETY,
BRIDGEPORT, IND., June 29, 1887.

S. D. Hillman, Secretary, etc.:

Your valuable report at hand. I have looked through it, and find it full of meat. I see you are making the tree peddlers' road a hard one to travel. That is right; he should be suppressed, or made to do an honest business.

The late spring frosts damaged our larger fruits badly. The continued dry weather is seriously affecting raspberries and blackberries. This will be the lightest fruit crop for several years.

Yours truly,

C. M. HOBBS.

KINGSTON, ILL., May 23, 1887.

S. D. Hillman, Secretary, etc.:

I am in receipt of report of Minnesota State Horticultural Society for 1887, which you had the kindness to send me. Please accept my sincere thanks for same. I think your reports are of real value to all horticulturists, but especially so to those who are just starting in the business.

With best wishes for your Society, I remain

Respectfully yours,

JACOB HECKMAN.

EDITORIAL NOTICES.

The fifteenth annual report of this wide-awake and efficient organization is received, through the kindness of its accomplished Secretary, S D. Hillman, Esq., of Minneapolis. In its number of pages (499) it is the largest, and in its contents certainly not below the best of the series, the possession of which has added much to the practical usefulness of our collection of horticultural and agricultural reports, which now covers those of most of the states and provinces issuing them. Secretary Hillman is aware of the importance of a good index, and that of this volume covers thirteen pages. The horticulture—especially the tree-fruit culture—of Minnesota is of great interest to the residents of the older portions of New England. From Minnesota we received the noble Wealthy apple, which has given greater impetus and hope to our orcharding than any previous accession. There is a good prospect that from the same source we shall get other equally good, and perhaps in some respect—such as long keeping—even better varieties. Two very fine Minnesota seedling apples, the Rollins Pippin and Giant Swaar, have done well with us; and Mr. Gideon, author of the Wealthy, is putting out a number of additional seedlings for trial, that are promising.—*Dr. T. H. Hoskins in Rural Vermonter.*

The annual report of the Minnesota Horticultural Society for the year 1887 is a handsome volume of five hundred pages, embracing transactions of the Society, proceedings of the Amber Cane Association, essays, reports, etc., which are of exceeding great value to those owning a farm or garden.—*Hastings Gazette.*

The annual report of the Minnesota Horticultural Society for 1887, just received, is a volume of 500 pages. It contains the transactions of the Society from March 31, 1886, to March 31, 1887; also the proceedings of the annual meeting of the Minnesota Amber Cane Association, several essays on horticulture and kindred topics, reports of committees and directors of experiment stations, reports of local societies, and of delegates to Wisconsin, Dakota, and elsewhere, and the secretary's portfolio, which contains gleanings from various horticultural sources, a feature which may well be considerably extended in future reports. The report also contains the horticultural enactments of the recent legislature, letters from distinguished horticulturists in other states, list of officers and members, etc. We do not know how large an edition of this book has been printed, but we wish a

copy could be placed in the hands of every farmer in the State.—*The Farmer, St. Paul.*

The fifteenth annual report of the Minnesota Horticultural Society makes a comprehensive volume of 500 pages, containing the essays, discussions, fruit reports and proceedings of the Society for the past year to which is added a report of the Amber Cane Association and reports from delegates to other societies. The book is beautifully edited by the secretary, S. D. Hillman of Minneapolis, upon whom it reflects great credit. The Society is supported by an annual appropriation of \$1,000 from the State, which also prints its reports. Its report is a model. It describes a horticulture entirely new to the great fruit growing sections of the country, for the cold north requires different varieties and treatment from those common to other sections. Every horticulturist north of 42° of latitude and west of the 8th meridian should procure and consult the practical experiences of the successful horticulturists of the Northwest, so well presented in this carefully edited volume.—*Farm and Home.*

We are in receipt of a copy of the annual report of the Minnesota Horticultural Society for 1887. It embraces the transactions of the Society from March 31, 1886, to March 31, 1887, also proceedings of the annual meeting of the Minnesota Amber Cane Association, essays, reports, etc. It is a good work for reference, and a copy should be in the hands of every amateur horticulturist in the State. *Dodge County Republican.*

The annual report of the Minnesota State Horticultural Society for 1886-7 is a volume of 500 pages. It contains the proceedings of the Society for the year, and contains many reports and papers of value and interest on matters of horticulture in its various branches. It is a matter of regret that, so far as we have examined, there is neither a name nor a line in the whole report that would lead us to believe there was such a county as Fillmore in the State of Minnesota. Mr. J. S. Harris of LaCrescent, Houston county, is a prominent member of the society and participant in its proceedings. Besides a report of the proceedings of the Wisconsin State Horticultural Society, where he was a delegate, and a report on seedling fruits, Mr. Harris presented four papers: "Small Fruits for Market and Home Use," "Propagating by Grafting, Budding and Layering," (illustrated), "The Codling Moth," "Fruit Growing in the Northwest," also two reports on fruit in Houston county. These papers fill sixty pages of the annual report.—*Lanesboro Journal, June 3, 1887.*

SELLING NURSERY STOCK.

Considerable discussion was had at our last annual meeting concerning fraudulent practices of itinerant tree agents and commission men. As a result thereof a committee of five was chosen, as you remember, to recommend some proper action to be taken in the matter, and they reported in favor of the passage of a law for the better protection of the public against frauds and willful misrepresentations in the sale of foreign nursery stock.

The Society adopted this report, and a bill was drafted which, with some amendments, became a law. Of course the passage of the bill was bitterly opposed by some—"No rogue e'er felt the halter draw with good opinion of the law." The "unconstitutionality" of the measure was strongly urged; but, after some delay, the senate passed the bill without a single dissenting vote, and later it passed through the house.

While there is some diversity of views among nurserymen and horticulturists in general upon this subject, a majority seem in favor of giving the law a trial. The subject is a most important one, in some respects at least, and is deserving of most careful thought and due consideration.

H. E. Van Deman, chief of the division of pomology, Washington, D. C., under date of Feb. 12, 1887, writes: "Your action regarding the protection of your people against tree swindlers is entirely in accord with my mind. I noticed a rather suppressed report (as I supposed) of the discussion in the papers. It would be an effectual cure of many of these ills if a state law can be passed which makes it a criminal offense to misrepresent the stock sold, and impose a license on the agents. Shall be glad to get a copy of the pending bill."

President J. M. Smith, of the Wisconsin Horticultural Society, who attended our annual meeting one year ago, was quite pronounced in his expression of opinion on this subject. In his address before the Wisconsin society in February last he says: "Last month, while attending the convention of the Minnesota State Society, the question of the fraudulent sales of fruit trees, plants, shrubs and ornamental plants came up, and was pretty thoroughly discussed." After referring briefly to the action taken, he thus concludes: "It does seem to me that some effort should be made to protect our citizens from this class of downright swindlers, for to me they seem to be that and nothing else."

Upon the other hand, some indignation was evinced by certain nur-

serymen, or agents, that such a law should be enacted here in Minnesota. At an informal meeting in Chicago, the latter part of June, preliminary steps were taken to test the constitutionality of the law, and over twenty different firms united in a pledge to share in the expense of bringing a test case, agreeing to use their influence, as therein expressed, "to defend what we consider to be the right of every nurseryman, namely, the right to equal business privileges."

However, for reasons best known to themselves, the project was not carried out. A better and more rational view perhaps was taken, that it would be the wisest plan to cheerfully comply with the provisions of the law.

We are informed by Col. Mattson, the Secretary of State, that numerous firms have filed the bonds required, and that so far as he can learn the law is working well. He states where parties understand the object of the law there seems to be no disposition to evade it, and he ventures the opinion that the law will prove effectual in the correction of the evils sought to be repressed, and in its moral influence, at least, will be productive of much good.

Another year we may be able to determine better than at present as to results to be accomplished by the law, and as to whether it should be amended, or peradventure be repealed.

MR. T. T. LYON.

During this last fall we had the pleasure of forming the acquaintance of T. T. Lyon, president of the Michigan State Horticultural Society, and of receiving a visit from him on the occasion of his western tour. He is a prominent fruit grower of that state, and has long been identified with horticultural organization in his own and other states, taking a lively and active interest in horticultural matters in general. He has recently prepared a valuable history of Michigan horticulture for publication by the society of that state. While here, Mr. Lyon accompanied us to the experimental farm, and seemed much interested in the operations being conducted there under the direction of the superintendent, Prof. Porter, and more especially with regard to experiments being made with Russian varieties, methods pursued in making tests, etc.

Mr. Lyon, although quite advanced in years, appears yet hale and hearty, and his step is firm and elastic. On meeting him one cannot fail to admire his quiet and unobtrusive manners, nor to profit from his extensive experience in horticultural affairs. He spent but a

few days in the State, but visited, we learn, a number of points of interest, returning home by way of Iowa, and going thence to Boston to attend the meeting of the American Pomological Society, at Boston, of which he was made vice-president. An excellent letter from him appears elsewhere.

FORESTRY.

We may be pardoned for referring to the forestry problem at some length, because of the importance of the subject and the awakening interest of late throughout the country in general with reference thereto.

Secretary Chas. W. Garfield, of Michigan, who is good authority on this subject, says: "Sweeping timber from our country is fast bringing about conditions which will render wheat growing unprofitable. What then?"

The importance of the preservation of timber, in its relation to agriculture, has engaged the attention of many intelligent farmers, and scientists as well. The national government has established its forestry division; New York, New Hampshire, Colorado and California have forestry commissions, and Ohio has its state forestry bureau.

OBJECTS TO BE SECURED.

Adolph Leue, the efficient secretary of the Ohio forestry bureau, in discussing the subject, says: "The forestry problem briefly stated is: To perpetually keep a certain percentage of the superficial area of our country in forests properly distributed, and to use and husband this in a manner that its usefulness be unimpaired.

"Forests serve, first, to ameliorate the climate by sheltering the ground, keeping it warm in winter and cool in summer; second, to regulate in a certain degree the water supply of our streams; third, to shelter our fields, our farm animals and our homes against the winds of winter; fourth, to furnish material for our various industries."

In addition to these objects there are numerous other considerations, such as the pleasing effect of woodlands, affording agreeable shade, the healthful influence of forests and groves, the protection to insectivorous birds, etc.

TIMBER AREA.

According to the census reports, there were about three hundred and eighty million acres of woodland in the United States in 1870, or

about twenty-five per cent of its entire area. The percentage in Minnesota was given as twenty and six-hundredths.

Secretary B. E. Fernow, of the forestry division of the agricultural department at Washington, in his annual report for 1886, presents some interesting facts concerning the significance of forests, their climatic influence, etc. He says:

"It is generally recognized that forests have always been important factors in the national life, the civilization and progress of the human race."

With reference to the climatic influence of forests, he states that "forests act like large sheets of water as a starting point for diverging winds. While the forest may not positively cause rain to fall, yet it does not at least prevent it, as the heated bare ground or field often does. The forest is a regulator of climatic, as it is of hydrologic extremes."

He gives a comparative table showing the farming interest in forestry property of the United States, which it is estimated comprises some thirty-eight per cent of the total area. The timbered area of Minnesota is thirty million acres, as compared with seventeen millions for Wisconsin, fourteen millions for Michigan, a trifle short of three million acres each in Iowa and Dakota, a million and a half acres in Nebraska, and three and one-half million acres in Kansas. From the statement referred to it appears that Minnesota is better supplied with forests than any other state in the union, certainly a most gratifying exhibit.

But while there seems to be an abundance of timber in Minnesota, in other portions of the western agricultural, prairie and mountain regions it appears to be decidedly deficient. Hence the imperative necessity of forestry preservation and improvement on the part of farmers and others.

MINNESOTA FORESTS.

Minnesota is the eighth state in the Union in the importance of lumber manufacturing interests. The principal centers of manufacture are Minneapolis and Anoka on the Mississippi river, Stillwater, Washington county, on the St. Croix, and Duluth, near the mouth of the St. Louis river.

Mr. Putnam in his report on the forests of this State says: "The great hardwood forests of Minnesota lie to the south and west of the pine forests, extending north and northwest from Freeborn and Murray counties into Marshall county, to within fifty or sixty miles of the

boundary line between Canada and the United States. This body of hardwood, which is some 300 miles long by some twenty miles wide, borders upon the prairies, and is the extreme western body of timber of any commercial value east of the Rocky Mountains. The surface of the land is level or gently undulating, well watered, particularly the so-called 'Park Region,' which lies in Becker, Otter Tail, Douglas, Stearns and Todd counties, and in fact extending through Wright, Hennepin, Carver, Le Sueur, Rice and Steele counties."

He describes our pine forests as "extending northwesterly through the counties of Chisago, Isanti, Mille Lacs, Benton, Morrison, Todd, Otter Tail, Becker, Polk and Beltrami, nearly parallel to the line of the hardwood forests, and crossing Red Lake River, extending to the north of Red Lake, thence easterly to the shore of Lake Superior at Grand Portage."

By the census of 1880 the white pine in Minnesota was estimated to be 8,170,000,000 feet, board measure. A little over one-third of this quantity was located on the Mississippi and its tributaries. In the belt of hardwood, extending west and south of the pine region, consisting of white, red and burr oak, sugar maple, poplar, etc., it was estimated there were 3,840,000 acres of timber remaining, capable of yielding an average of fifteen cords of wood per acre, or 57,600,000 cords. The amount of timber cut per year, exclusive of staves and headings, was estimated at 36,884,000 feet.

FORESTRY IN EUROPE.

The causes of the destruction of forests have been the same in the old world as in the new. The greed of men, the desire of speedy gain without reference to consequences, the want of judgment and knowledge as to cause and effect in the courses of nature and its developments, have razed and shorn the forests along the spurs of the Alps and the shores of the Mediterranean with the same merciless energy which has been displayed in this direction along the shores of American rivers and on the slopes of American mountains. As a result of this process large areas of the shore provinces of Austria-Hungary are now almost an arid desert. There is little timber in Dalmatia and Istria and the territory near Trieste. The dearth of timber is so pronounced that the region has been denominated "The Karst," which in common acceptance is almost synonymous with "Sahara."

It is stated that some four hundred and fifty years before the Christian era these woods furnished the material for Roman castles, houses and ships.

- The result of this deforestation in a climatic direction has been highly disastrous. The same region which had been famous for its mild and temperate climate has become changeable and unreliable; landslides and avalanches have come and gone, mountain creeks have become dry, and the whole face of the country has been changed from a rich, fruitful and salubrious climate to one arid, sterile plain, interspersed with stony and parched hillsides, populated by meagre sheep and goats and their equally meagre owners.

The work of reclaiming these forest areas is performed under the supervision and the direct advice and control of forest officers, who are paid by the government.

In southeastern France, where the gradual destruction of forests has been pursued for centuries past, the soil of thousands of acres of high pasture land has been washed away by violent vernal and autumnal rains, and sudden floods and violent winds which have prevailed have destroyed large areas of forests. The consequence has been highly disastrous in all that mountainous region. The barren hills have been seamed by rugged chasms and gullies, and the fertile valleys below have been devastated with floods of a turbulent and destructive nature.

To resist this process of destruction the French government began some seventy years ago a system of forest supervision, followed later by the replanting of trees, and under the system employing a large corps of officers and men. Up to 1879 about 250,000 acres of practically waste land had been reclaimed at an annual expense to the state for a period of nineteen years of about \$500,000.

In Germany the destruction of forests has been very notable. It is stated that "many countries which flourished in former times have, by devastation or extermination of their forests, fallen into pauperism and cultured decrepitude." Neheugen, from the destruction of forests in the seventeenth and eighteenth centuries, became a desert. Moveable sand now covers vast fertile tracts in adjacent districts. Villages, where the farming population lived in prosperity, have disappeared or fallen into ruins.

In northern Hanover there are deserts subject to violent hurricanes, which with other causes prove an obstruction to all efforts to prepare the land for cultivation or to renew foresting.

In other localities equally appalling results are observed from the despoiling process.

THE AMERICAN FORESTRY CONGRESS.

At the sixth annual meeting of the American Forestry Congress, held at Springfield, Ill., last September, it was stated that the combined forests of the Northwest are being cut at the rate of 800,000,000 feet per year. At this rate of deforestation it is estimated that within fifteen to twenty years the great pine forests of Minnesota, Michigan and Wisconsin will be obliterated as an article of commerce.

It was there suggested that, if these forests were to be destroyed, the great rivers of the Northwest would in the dry season become less than the babbling brooks instead of the commercial waterways as they are now."

Col. Robertson, of St. Paul, who attended the meeting above referred to, read an interesting paper on climatology, etc. You have also heard from him in person at this meeting on this and kindred topics.

Mr. Newlon, of Kansas, read an interesting paper on "Helps and Hindrances to Kansas forestry." He stated that the farmers of that state had done much in the way of grove and tree planting on their farms and around their orchards. These efforts were already affording a rich return. All that was needed in the future was intelligent discussion and agitation to stimulate in the minds of the masses an inspiration for forestry. Among the "hindrances" were mentioned the great drouths, fires, birds and insects; also the cutting of timber as rapidly as it grew. The slaughter of the birds was particularly deplored.

The reports as to forestry in Nebraska were of an interesting nature. There is awakened interest among the people on the subject, and efforts are there made to interest the children of the public schools.

Among the measures recommended by the meeting was the passage of a bill in Congress for the protection and administration of the forests of the public domain. The bill provides for the designation of public forest lands to be owned and controlled by the United States; withdrawal of such lands from sale, to prevent entries upon public lands; for a commissioner of forests; the establishment of forest reserves; imposing penalty for timber cutting; and appropriating five hundred thousand dollars to carry out the provisions of the act.

Prof. J. L. Budd, of Iowa, read an interesting paper entitled "Possible modification of our prairie climate," in which he states: "We

are anxious to impress the fact that successful orcharding, small fruit growing, and crop production in field and garden, depend more on extremes of rainfall, temperature and atmospheric humidity than on monthly or longer periodic means."

Prof. Budd further says: "Facts too evident for successful refutation lead us to believe that the tendency to extremes of drouth will become still more manifest as the prairies become more generally occupied and cultivated, unless the evils we have brought about be not mitigated or perhaps wholly removed by planting a due proportion of the country with forest trees."

STATE AGRICULTURAL SOCIETY.

January 10th the meeting of the State Agricultural Society was held at St. Paul, for the transaction of business connected with that society. There are, it seems to us, some figures presented by the report of the treasurer that are of more than passing interest. The receipts from the fair, held in September, from tickets sold, entrance money and privileges, was the sum of \$72,303.52. The annual appropriation was \$4,000; other receipts make the grand total \$79,303.98.

Of the disbursements the largest items were: Premiums and awards, \$9,881.64; race purses, \$15,135; special attractions, \$13,438.75. The net profits of the fair were something over \$18,000. The amount of premiums awarded in the horticultural department was as follows: Fruits, apples, \$167; grapes, \$125; small fruits, \$60; flowers, \$188; vegetables (including county societies), \$559; culinary and domestic department, \$312; total, \$1,225.

In addition to the amount of receipts above noted the sum of \$25,000 was received from the State, being one-half the special appropriation in aid of the society. The report shows a balance of something over four thousand dollars in the hands of the treasurer, after paying certain items of indebtedness for improvements made, expense of fair, etc.

The value of the fair ground property, including two hundred acres, estimated at \$200 per acre; main building, \$24,000; grand stand, \$21,000; nineteen stock barns and stables, \$35,500; other buildings and sheds about \$80,000, and including the sum of \$25,000 due from the State, with certain other minor items mentioned in report, give a grand total of \$597,131.92.

A detailed report of the transactions of the Agricultural Society, including statements as to receipts and disbursements made, premi-

ums awarded, etc., etc., will be made by the efficient secretary of the Society, Hon. H. E. Hoard. This is the first time in the history of that organization, during an existence of about thirty years, that a detailed report has been furnished for publication in permanent form. This exhibit is one which should reflect credit upon the people of not only this State in general, but upon the able management of the board of agriculture of Minnesota. For further information on this subject we commend our members and others interested to the report of Secretary Hoard.

EXPERIMENTAL WORK.

We wish to call attention briefly to what is being done on experimental lines for the promotion of horticultural progress in the State. It is well known that this important field of work has been too much neglected; that while we have a goodly number who are thoroughly in earnest and doing valient service, and who are making steady progress in this important field, still it is found to be impracticable for this Society to render its material assistance. We havn't the authority or power to use our funds in that direction. Hence the experiments which have been carried on have been conducted almost wholly by individual enterprise.

The obstacles which have been met in this direction have been of such a nature as to preclude the power for rapid or substantial progress being made. Too many have been heard to say "it costs too much" to make experiments; adding that the money will be 'wasted,' or the results will prove a "failure."

But these short-sighted individuals are far behind the times. They fail to recognize the spirit of the age in which we live when "progress" seems to be the watchword everywhere. They do not seem to catch the inspiration of advancements being made in every field of thought as well as every line of work. Says Mr. Wilder, in his address elsewhere alluded to: "Although we may not be able to prescribe the exact limits to which improvement may be extended, we know that upon the subtle forces of hybridization, either accidentally or by the hand of man, we must ever depend for the improvement of our fruits."

He further says: "From the sour crab, the puckery pear, the bitter almond and the austere plum, came the tender, spicy apple, the melting juicy pear, the velvet luscious peach, the delicious purple or golden plum; and from our rank and foxy grape came the splendid varieties which now adorn our tables and 'make glad the heart of man.'"

We point with pleasure to reports elsewhere presented by several of our earnest workers who are conducting practical experiments on horticultural lines. We trust their efforts will be much enlarged upon and be extended in the future. Since the appropriation made by the Hatch Experiment Station law has now become available, we hope the members of this Society will render every assistance in their power for carrying forward this worthy enterprise.

We had desired to mention briefly some other matters of passing interest, but lack of time and space forbid. We beg indulgence for this imperfect and very hastily prepared report; and in sincerest thankfulness, returning many kindly words and favors shown your Secretary in the past, we bid you in the worthy cause you represent, a truly hearty Godspeed.

FINANCIAL REPORT OF SECRETARY.

The following is a statement of receipts and disbursements by the Secretary for the year ending Jan. 16, 1888, as shown by itemized statement submitted:

RECEIPTS.

Membership fees for 1886-7.....	\$46 50
Membership fees for 1888-9.....	16 00
Amount to balance	8 95
Total.....	\$71 45

DISBURSEMENTS.

Railroad fare and entertainment paid.....	\$1 85
Cuts and engravings	9 30
Postage stamps, cards and wrappers.....	18 60
Expressage	19 35
Printing and stationery	22 15
Total.....	\$71 45

Respectfully submitted,

S. D. HILLMAN,

Secretary.

TREASURER'S ANNUAL REPORT.

To the President and Secretary of the Minnesota State Horticultural Society:

As Treasurer of the Minnesota State Horticultural Society, I submit the following statement of receipts and disbursements of the Society from Jan. 20 to Dec 5, 1887, inclusive:

RECEIPTS.

1887.

Jan. 20.	Contingent fund on hand last settlement.....	\$809 47
April 1.	Premiums awarded at New Orleans Exposition.....	50 00
July 6.	State Treasurer, one-half annual appropriation for 1887.....	500 00
Sept. 14.	Andrew Peterson, membership fee, 1887.....	1 00

Total receipts \$1,360 47

The following disbursements have been made, as shown by vouchers herewith returned:

DISBURSEMENTS.

1887.

Jan. 22.	A. W. Sias, vice president, expenses, winter meeting.....	\$5 00
	M. Cutler, vice president, railroad fare.....	1 50
	E. A. Cuzner, expressage, etc....	3 25
	J. M. Smith, expenses, by request of Society.....	12 00
•	Premiums paid at the Winter Meeting.....	79 00
25.	Donaldson & Ogden, plates, per Brimhall.....	2 28
Feb. 1.	Pioneer Press, 5,000 copies President Northrop's address.....	50 00
Feb. 22.	J. S. Harris, expenses as delegate to Wisconsin.....	12 00
April 1.	S. D. Hillman, first quarter's salary.....	125 00
July 1.	S. D. Hillman, second quarter's salary.....	125 00
	Pioneer Press Co., binding reports and wrappers.....	106 00
28.	S. D. Hillman, postage on reports, 1887.....	120 00
Aug. 5.	A. W. Sias, expenses on Seedling Committee.....	25 00
	J. S. Harris, expenses on Seedling Committee.....	35 04
Oct. 6.	S. D. Hillman, third quarter's salary.....	125 00
Dec. 1.	J. T. Grimes, incidental expenses.....	2 10
5.	J. T. Grimes, salary to date.....	21 88

Total expenditures \$850 05

Balance in Treasurer's hands..... \$510 42

\$1,360 47

The contingent fund of 1885 was \$882.40; from which has been taken for the year 1886, \$72 93; and for 1887, \$358.47.

There is due to the Society from State appropriation for current year, \$500.
No report has been made to me by the Secretary of membership fees.

All of which is respectfully submitted,

J. T. GRIMES,
Treasurer.

The reports of the treasurer and the financial report of the secretary were referred to the Finance Committee, composed of members of the Executive Committee.

Mr. Harris, chairman of the committee, presented a report subsequently that the committee had examined the accounts and the same were correct and duly approved.

RESIGNATION OF TREASURER GRIMES.

To Wyman Elliot, President of the Minnesota State Horticultural Society :

Having made arrangements to be away during the winter, so that I will not be able to attend to the duties of the office which I now hold under the direction of the Society, I herewith respectfully tender my resignation to take effect Dec. 5, 1887. A statement of the finances, with the books and vouchers, will be placed in the hands of the Secretary. If there should be any errors they will be promptly and cheerfully corrected.

With my best wishes for the interests and welfare of the Society, I remain, truly,

J. T. GRIMES,
Treasurer.

P. S.—My report shows that there is in my hands \$510.42, which I will hand to you.

J. T. G.

LIBRARIAN'S REPORT.

The number of reports in storage at the agriculture building of the State University at Minneapolis, Jan. 17, 1888: 1886-73, cloth, 203; 1874, paper, 398; 1875, paper, 68; 1876, paper, 693; 1877, paper, 367; 1878, paper, 144; cloth, 32; 1879, paper 7; cloth, 3; 1880, paper, —; cloth, 90; 1881, paper, 1,250; cloth, 206; 1882, paper, 1,744; cloth, 587; 1883, paper, 338; cloth, 987; 1884, paper, 750; cloth, 512; 1885, paper 140; cloth, 3; 1886, paper, 672; cloth 154; 1887, paper, 372; cloth, 78.

Two complete sets were sent to St. Paul and one hundred and sixty-eight volumes, comprising sets in part, were distributed as advised by the Secretary.

E. A. CUZNER,
Librarian.

Mr. Fuller. Mr. President, I see by the report just read that some money was received by the Society from New Orleans. I should like to ask if there has ever been any report made as to the manner in which the money appropriated was expended there. I see the governor of Michigan has been compelled to make a report of the expenditure of money used for that purpose; and the question has arisen in my own mind whether any report has been made as to the money appropriated from this State?

President Elliot. Personally I could not answer, but I think Prof. Porter could give some information, perhaps, upon that subject.

Prof. Porter. Is Mr. Gibbs here? If he was here he could give you a good deal more information than I can. He was commissioner from our State. I was acting commissioner for six weeks while he was at Washington. We not only had no money to meet all the expenses of the State, but we had none to get the exhibits back home and distribute them among those gentlemen who had made contributions. Personally, I devoted a year of time to that work. I never received one dollar from the beginning to the end for my services. Not only so, I paid a great many dollars out of my own pocket to get our exhibits back home and distribute them to exhibitors throughout the State; all of which is charged up to profit and loss.

A detailed report would have been made had there been any funds to defray the expense of publication. Gov. Hubbard, in order to meet the expense of making an exhibit that should be of credit to the State, was obliged to draw from his contingent fund every dollar that he could possibly spare in order to close up in a proper manner. And therefore nothing was left at that time to publish reports.

The plan that was adopted by Commissioner Gibbs for the publication of that report did not meet my approval entirely. He advised that the report should be made by the commissioner. I understand he lays some blame upon Mr. Marvin, who was in charge of the dairy exhibit, and myself, because we haven't made a detailed report to him. I rendered a report of my department as commissioner of agriculture some eighteen months ago, perhaps; I did not render a report as chief

of installation, because I had my hands about four times more than full of routine work, and I had spent a good deal of time already, you know, for the State at New Orleans; and I didn't intend to do any more work "free, gratis, for nothing," and pay my own expenses.

Mr. Fuller. I am glad to hear this statement, because it is a matter of which I know nothing, and inquiries have been made.

Prof. Porter. This report will be published, as that is the intention of both Gov. McGill and Gov. Hubbard. It is understood the report will now be made; the required funds will be furnished by private parties, or from the contingent fund of the State, or from an appropriation by the legislature. It is right and proper that a report of that exhibit should be made. It was the best state exhibit made at the Exposition at New Orleans; our State was the best represented there. The \$30,000 expended by the State should be properly accounted for. It has not been done heretofore only from lack of funds. The officers of the State have desired the report to be made. The State had money enough, but it could only be drawn according to law. I have just learned from Col. Young that the report is prepared and is now in the governor's office.

The following paper was then read:

THE CULTURE OF SMALL FRUITS.

By Wm. Danforth, Red Wing.

That the cultivation of small fruits should be so generally neglected by people who live in the country, is a fact for which it is difficult to account, especially in a land so peculiarly adapted to their growth as this. A large portion of our people in this State of Minnesota neglect not only the cultivation of small fruits, but even the vegetable garden. You may possibly find a few beets, onions and cabbages; but no Lima beans, celery or cauliflower. You may occasionally find a few strawberries in some out of the way place, or some neglected raspberries in a fence corner, to be out of the way of the plow or team, grown up with grass and weeds—stalks mostly dead. Few people would turn away from a dish of ripe, plump strawberries powdered with sugar, or from a plate of melting raspberries and cream, but farmers think this luxury is not for them.

I can look back to the time, when a boy, I watched for the first wild strawberries of the season, to get the first ones for my mother, and traveled along the hedges and stone wall for the earliest raspberries, and how highly I prized the small area that was given me to set

a few cherry and plum trees, and a few peach trees. I know I trespassed, and took more ground than was allotted me.

The success of growing small fruit here depends mostly upon the location, the soil, and the man himself. I find our sandy loam adapted to all varieties of strawberries that we can grow so far, with fair results. We like top dressing the grass land, making it as productive as possible for grass. Then for setting plants the next spring, use what fertilizers you have—there is nothing better than stable manure. Do not be sparing, as the richer the soil is the more abundant crop may be expected. Plow deep as soon as possible after the grass is cut. In the spring plow again, and have the soil well pulverized. Mark off in rows three and one-half feet apart, and set the plants from fourteen to twenty inches in the row, according to variety—fourteen inches for Wilson, eighteen to twenty for Crescent. The latter is a pistillate variety, and the rows should be alternated with some variety that is perfect flowering.

I have raised many varieties, and consider the Wilson, Crescent, Charles Downing, Glendale and Manchester all good.

Care should be taken that the plants are protected from the sun, and the roots kept moist after being taken up till they are put in the ground. One man may take up plants, and others trim them and set as soon as possible. A dibble of good size for making the holes is convenient. Spread the roots, fill in with earth, pressing it firmly about them. Have the crown of the plant just even with the surface of the ground. They need now to be thoroughly watered. Before any weeds are seen the cultivator should be started, working as near rows as possible, stirring the ground but not throwing any earth toward the plants. Continue using the cultivator every ten days or two weeks, through the season, also hoe the plants every two or three weeks. We do not expect fruit the first summer, therefore take off all fruit buds as soon as they appear. In the fall a good dressing of ashes is beneficial. I have used three hundred bushels to the acre with good results. As soon as the ground is frozen cover the field with straw, cornstalks or leaves. The next spring but little need be done except to rake the mulch from the plants, and leave between the rows. After the fruit is gathered, if any weeds are grown, mow them, and if the ground is not well mulched put more on, and then set the fire and burn the field over. If the burning is not too severe, you will find no bad results, and but little labor to secure another crop.

The raspberry may be planted in fall or spring. I prefer early fall

planting, having the rows six feet apart, and the plants in the row four feet. We have the Doolittle, Mammoth Cluster, and Gregg for black; the Turner, Philadelphia, and Cuthbert for red. We cover the Cuthbert and Gregg with earth and mulch all kinds heavily. All large bushes need supporting by stake or wire. We trim as we find time through the summer. Suckers should be treated as weeds unless plants are wanted. The thorough mulching helps keep down weeds and ensures a crop if the season is dry.

For blackberries I make the rows seven feet apart, and plants four feet in the row. I have the Ancient Briton, Snyder, and Lawton. The Lawton with protection is a good bearer. The Snyder has not done well—seems hardy but does not yield much fruit. The Ancient Briton I consider a profitable variety if rightly managed. It must be laid down and covered with earth; and all kinds require to be supported with stakes, or stakes and wires. Our rows are mostly north and south. I have no choice of the points of compass. I find the stalks soon come up straight after being taken up.

To raise currants, work the soil, enrich and thoroughly mulch. In the fall cut out all old wood and leave seven or eight thrifty stalks.

I think small fruit pays richly in the family. Beginning with strawberries in the early part of June, one can have a succession till the frost comes and cuts off the blackberry crop. Then if any time you have a surplus, some one is ready to purchase, or if your home market is overstocked, the wholesale dealer is ready to take all you have to spare.

DISCUSSION.

Mr. Wilcox inquired as to cause of failure of the Snyder.

Mr. Danforth did not know the cause unless it was from lack of drainage. The land needed thorough drainage by tilling and he would try that the coming season. Other varieties had succeeded well. He had a clay subsoil, and there was standing water on the ground at times.

Mr. Busse. I would like to ask how you cover the Ancient Briton without breaking the canes?

Mr. Danforth. We use a fork to loosen the dirt on one side of the hill and then bend them over. The ground descends to the north and we bend them carefully up the hill, using the foot and in handling wearing a leather apron.

Secretary Hillman inquired as to the amount of his grape crop.

Mr. Danforth said it was a good yield, but he had not had much

time at home, and could not answer definitely.

Secretary Hillman. What varieties are you growing?

Mr. Danforth. We have the Concord, Delaware and some of the Rogers

President Elliot. Have you kept any record of the amount of fruit you have gathered per square rod of any of these different varieties you are cultivating?

Mr. Danforth. I haven't this last season; but I have received from three-quarters of an acre of ground three hundred and fifteen dollars, besides what was used by the family.

Mr. Pearce recommended mulching strawberries between the rows; as early as the first of October putting on four or five inches of mulching and covering the plants to the depth of an inch.

Mr. Danforth said mulching was of advantage to prevent drouth. He had raised good crops for twelve years, and the last was one not to be ashamed of.

Mr. Cutler. As to the plan of burning the plants off after the crop, I would say I tried it with my strawberries and found it injured the plants.

Mr. Danforth. You want to give them a slight burning on a windy day; you can burn too much and destroy the root; you want to do it just right. You will get rid of the vines and have the best crop of berries.

President Elliot. And get rid of the insects too.

Mr. Day. What is your location?

Mr. Danforth. I am two miles west of Red Wing. We have all kinds of soil, but the best results are generally on a sandy loam. I prefer a gentle slope to any other location I can get.

The following was read by the Secretary:

FRUIT GROWING AMONG THE MENNONITES—CULTURE OF THE DEWBERRY.

By Dewain Cook, Windom.

J. D. Hillman, Secretary, etc.:

Yours of Dec. 19th at hand, requesting a short article on fruit growing among the Russian Mennonites, and a few notes on the Dewberry.

About one-fourth of the population of Cottonwood County are Russian Mennonites. They are an honest, sociable and prosperous

people. Coming from a country where fruit was abundant, they take considerable interest in horticulture; nearly all of them have their well-kept groves and flower gardens, their currant, raspberry and goosberry patch, grape vines, apple trees, etc.

It may be of interest to the public to know that they are planting freely of the seeds, and are growing seedlings of many varieties of the fruits of their former homes in the old country. They have grown fine crops of seedling Russian cherries and plums.

They have also many seedling Russian apple trees, and several varieties of Russian pears; the most common is a variety they call the Kruskaeye, which is a beautiful and rapid-growing tree, claimed to be as hardy as the cottonwood. I have seen specimens of this tree twelve feet high, and about six inches in diameter.

At our county fair the past fall our Mennonite neighbors took most of the premiums offered for fruit, including the best collection of fruit.

THE DEWBERRY.

I consider the dewberry of special value for the Northwest, particularly on the prairies, for the following reasons: Being of low, spreading growth, the vines are not injured by our heavy winds or snow banks; they are as easily given winter protection (where necessary) as the strawberry.

The dewberry (Lucretia) is the only blackberry recommended for general cultivation by the Eastern Iowa Horticultural Society. I think the Dewberry will soon be popular all over the Northwest.

My experience in growing the dewberry has been mostly confined to the variety known as the Windom. I will give you a short description of it.

Old canes grow from one and one-half to two feet high, with numerous short branches; is short-jointed, often three or four to the inch; fruit-stems rather long and slender; blossoms all on the outside of the hill, nearly hiding the foliage from view; the blossoms and young berries on each hill usually have the appearance of growing in one immense cluster, but as the berries get size the fruit stem droops, the plant gradually settles, and at the time of ripening the fruit is mostly shaded by the new growth of the plant, and is thus protected from the sun, wind and beating rains. Fruit will keep perfectly on the vines ten days or more after turning black. There is usually some imperfect fruit, sometimes considerable of it.

A few have failed to make a success in growing the dewberry. I

believe the cause in most cases was in not understanding the nature and wants of the plant they cultivated. The difficulty I believe is this. Many varieties are pistillate; some varieties are weak in pollen, but when properly managed are exceedingly productive.

It is essential to success with most varieties of the dewberry that we understand the various causes of imperfect fruit, and when we have learned this, and the remedy, we have learned the art of successful dewberry culture, as well as of many other varieties of small fruits.

To begin with I should select the best variety I could find, and plant on rich soil, in rows five feet apart and about two feet in the row, giving thorough cultivation the first two or three seasons. As a rule they make but small growth the first season; the next season, if the conditions are favorable, they will often make an immense growth of cane, the condition desired for propagating by layering; but as you value your fruit crop do not do it; it is a heavy draft on the vine, causing a late growth and poorly developed fruit buds, and a corresponding tendency to imperfect fruit the following season.

Again give your plants some kind of winter protection, if only snow; they are as easily protected by mulching as the strawberry. The canes are much injured by the winter or otherwise we can hardly expect them to produce an abundance of pollen, or to perfect a large crop of fruit.

Again the rapid and excessive growth of canes, caused by rich soil and much cultivation, is not its normal condition, and is unfavorable to the production of perfect fruit.

Pinching back the new growth and cutting all the suckers out, will produce extra fine fruit, but with the grower for the market I hardly think it will pay. High culture should end where it ceases to be profitable.

When the dewberry begins to bear well the new canes grow less rapidly, are hardier, have stronger fruit buds and consequently better fruit the next season. I allow the vines to mat in the row and cut out but few suckers. It needs in some respects about the same management as the strawberry. It has this difference, it takes the dewberry two years to get ready for a crop but it will continue profitable on the same patch for many years.

The conditions of success are: Good varieties, good soil, thorough cultivation of young plants, keeping free from all weeds, and winter protection. Always remembering that anything that weakens the vitality of the plant *must* be avoided.

The following paper was read by the Secretary:

EARLY BEETS AND TOMATOES.

By Joshua Allyn, Red Wing.

S. D. Hillman, Secretary, etc.:

Your program at hand. I see I am booked for early beets and tomatoes. I regret I cannot attend the meeting this year, and must give you a brief written report of everything. As this is my own practical experience it may not amount to anything with others, but I will endeavor to give you my method of raising early beets.

About the middle of March the seed is sowed in shallow boxes; my boxes are about twenty-four by eighteen inches in size, four inches deep. I try to have four hundred to five hundred plants in each box; they are placed in hot house and forced to rapid growth until middle of April; then set boxes in cold frames and gradually harden them until they will stand quite frosty air. By the first week in May they will do to set out or transplant in bed. As soon as the ground can be worked in the spring these beds must be manured, plowed, dragged and worked thoroughly and two or three times before setting the plants. This stirring the ground warms and loosens it, and the young roots can soon get the benefit to repay all trouble.

The same directions can be followed for turnips, onions, etc., especially when sets are scarce. Early onions can be grown this way, and only need to be tried with success to be followed each year.

These articles of food may seem of small account, but I find in this small place extra early beets amount to quite a little. I think the Minneapolis market could easily take care of forty thousand bunches before the usual crop is ready.

EARLY TOMATOES.

Tomato seeds are sown in same kind of boxes as beets. For the earliest varieties sow first of March. We use Canada Vick for early. A week later sow late kinds. With us the Acme does best usually for late. The first idea is healthy, stocky plants, and I urge them as fast as possible; with this object in view they must have plenty of fresh, warm air to grow dark colored leaves, heavy roots and thick stock. I do not allow mine to stop growing.

When they have three or four leaves I pick out with care, transplant in other boxes, same size, give same temperature and treatment

until about the middle of April, when they are ready to leave the hot house and to try the compost bed.

The method of forming the compost bed is a point I shall have to explain; it is made of stable manure hauled during winters, and the deeper the better. I place my frames on this and fill them in with earth five or six inches deep; place on sash; in a day or so the dirt is warm; then use all the care possible in setting out the plants. To have root whole set with ease; leave sash off all the time it is safe, giving the tops all the air you can. The under heat will take care of the roots, although it may seem to a new beginner too much.

If you give them the proper attention, by the tenth or twentieth of May you will have No. 1 plants, heavy roots, full tops with buds and even blossoms. I have had them well set with tomatoes before setting them out in the field.

They are now ready for the next place, which should have been chosen with care on a light, sandy soil, sloping to the south, should be well worked and manured. The last plowing I have done on the day I set them out, and I give it a good top dressing; then thoroughly drag it. About 4 P. M. set your plants, which must be well watered the previous night. Before taking up the ground must be saturated, then in the morning lift each one from the bed with plenty of earth; press gently between two hands the earth in a ball; place in a cool cellar in boxes until setting out in the afternoon; or even the next afternoon they will keep damp and fresh treated in this way. Of course after a shower is the best time; but do not wait for that as they will do well without.

Now I have one hand go with narrow spade and spade holes about six inches deep, another hand with water, a pint or more to each hole; another hand drops the plant in the hole, and the last one places the plant aright, firmly settles the dirt and the plants will not even wilt; your first buds are sure of fruit unless the frost takes them, which at the twentieth of May seldom happens, although I had a whole field of them cut down after this date.

The cultivator should be started soon, even in a day or two, and often used.

The compost bed is used for lettuce and other early things. When so used a tight board fence is placed around it and the hogs have it for the summer to work and root it. When fall comes I have a fine bed of manure, well rotted and worked over, ready to haul on the land to make room for a new compost bed.

REPORT ON VEGETABLES AND SMALL FRUITS.

By Wm. Lyons, Minneapolis.

The past season has not been as favorable for the gardener or farmer as the average, it being one of the dryest ever known in the Northwest, yet in the vicinity of Minneapolis and St. Paul there were quite a number of refreshing showers, which done a great deal of good; but they were local in their nature. Thus while one location got rain, others only a few miles apart had to suffer from drouth.

Early vegetables were extra fine and abundant, owing to a very favorable spring, and brought satisfactory prices.

Late planted vegetables, such as potatoes, cabbage, celery, etc., were benefited by late rains, and yielded a good crop; and, where properly cared for, brought the best returns for the gardener's labor.

A severe and an unexpected frost in October did a great deal of damage to potatoes, and destroyed nearly all the late cabbage crop, consequently vegetables are scarce and dear in our markets.

At the present time, while the early and late vegetables yielded good crops, the medium planting were almost, and in some instances entire failures, the potato crop seeming to suffer most from the effects of the drouth. Our markets were well supplied with home grown vegetables in their season, except celery, of which the supply generally came from Michigan.

I don't feel like charging the drouth altogether with our short crop of potatoes; in the absence of a name for the difficulty I will call it a blight. About the 20th of June there were several heavy showers; immediately after I noticed small spots of rust on the leaves, and they continued to grow larger until the leaf was destroyed; then the vine became affected and died a premature death. All the potatoes in my locality that had reached a certain stage of growth were affected in the same way.

Would like to hear what Prof. Porter has to say on the subject. I had seven acres affected in this way; the land had been seeded to clover and timothy, and pastured for a number of years; broke up the fall previous. At the time the blight struck them they were a promising patch of potatoes as I ever saw.

Early Ohio and Pearl of Savoy yielded about 100 bushels per acre. Clark's No. 1, Beauty of Hebron, White Star, and White Elephant were not worth digging.

FRUITS.

I will speak first of strawberries. They suffered more from drouth

than any other small fruit in this locality. The first pickings were small and inferior. About the middle of the season the drouth was broken by some heavy showers, which gave everything a new lease of life, and strawberries did fairly well to the end of the season; some late patches on moist land yielded a good crop and brought fair prices.

The rain came at the right time for raspberries, the reds yielding the largest crop I ever remember of seeing in this vicinity; black raspberries, what few were grown, did very well.

Blackberries yielded a large crop of fine fruit and brought high prices. This delicious fruit is sadly neglected, by our fruit men. Currants were also a good crop, and brought high prices. If our fruit men don't move faster in this matter in the future than they have in the past, it will be a long time before our markets are glutted with either blackberries or currants. Gooseberries, like the Wilson strawberry, won't grow on my soil.

THE PRIZE ESSAYS.

I am glad our Society has taken a new departure this year, and in the right direction, namely, offering prizes for essays written by young men and young women. I have often felt and remarked that for some reason young men and women do not attend and take part in these meetings as much as they should; the making of intelligent horticulturists ought to begin with youth and vigor. The Society can do nothing that will yield grander results than that of getting the young men and women of the State interested in horticulture.

I would suggest that, instead of offering only one large prize for the best essay, that it would be better to offer smaller prizes and more of them. Composition in the country is sadly neglected. Many of the young folks understand fairly well how to grow crops of fruit or vegetables, but you ask them to put their ideas on paper and they can't do it, since they are not trained in that way.

DISCUSSION.

Prof. Porter. With regard to the cause of blight on potatoes, referred to by Mr. Lyon, I would say that I observed the same condition on our grounds. I have been investigating the matter somewhat. As 'two swallows don't make a summer,' I have nothing to say as yet as to remedies, at least till another season.

Mr. Smith. I had a patch of Early Rose that was heavily mulched, using about five inches of mulching on the surface between the rows;

the result was a yield of over a hundred bushels to the acre. In another patch adjoining there was no mulching used and the potatoes died and produced no crop.

Col. Stevens. The secret, I presume, was the moisture caused by the use of the mulching. That is no doubt quite important in a dry season like the last one.

President Elliot stated that a covering of straw was often beneficial in retaining moisture, especially with light and sandy soil. When the heat is too intense the vines become cooked and blight results.

Mr. Herzog was called upon to give his experience with potatoes, and stated that he had planted two acres of Beauty of Hebron and an acre and a half of Burbank Seedling; planted side by side on sandy soil. The former variety yielded two hundred and twenty-five bushels per acre and the latter but seventy-two bushels, and were comparatively worthless. He could not understand the cause of the failure.

President Elliot said the Burbank would not thrive on sandy soil, whereas the Beauty of Hebron was at home on sandy soil.

Mr. Smith. I planted two bushels of Burbank on sandy soil and didn't get my seed back.

Mr. Harris, from the committee on award of premiums, presented a report, which was, on motion, adopted:

AWARD OF PREMIUMS.

We, the members of the committee on awards, have discharged our duty to the best of our ability, and report the following:

APPLES.

	Premium.	Amount.
Best collection Minnesota apples, Ditus Day, Farmington	First.	\$5 00
Best display Wealthy, Ditus Day, Farmington	First.	3 00
Plate seedling apples, J. S. B. Thompson, Grundy Centre, Iowa .	Honorable mention	

GRAPES.

Best display Brighton, A. W. Latham, Excelsior	First.	5 00
--	--------	------

CRANBERRIES.

Display cultivated cranberries, A. B. Lone, Pine Ridge	First.	5 00
--	--------	------

PLANTS AND FLOWERS.

Display ornamental and flowering plants, Mendenhall greenhouse, Minneapolis.....	First.	\$5 00
Collection roses in pots, Mendenhall greenhouse, Minneapolis....	First.	3 00
Display geraniums, Mendenhall greenhouse, Minneapolis.....	First.	2 00
Single plant in bloom, Mendenhall greenhouse, Minneapolis.....	First.	2 00
Display Begonias, Mendenhall greenhouse, Minneapolis.....	First.	2 00
Display carnations, Mendenhall greenhouse, Minneapolis.....	First.	2 00

OUT FLOWERS.

Floral design, Mendenhall greenhouse, Minneapolis.....	First.	5 00
Collection roses, Mendenhall greenhouse, Minneapolis.....	First.	3 00
Hand bouquet, Mendenhall greenhouse, Minneapolis	First.	3 00

VEGETABLES

Best display, William Lyons, Minneapolis.....	First.	5 00
Best display, H. F. Busse, Minneapolis....	Second.	3 00
Early Potatoes H. F. Busse, Minneapolis	First.	2 00
Early Potatoes, William Lyons, Minneapolis....	Second.	1 00
Winter and spring potatoes, H. F. Busse, Minneapolis.	First.	2 00
Winter and spring potatoes, William Lyons, Minneapolis.....	Second.	1 00
Onions, William Lyons, Minneapolis....	First.	2 00
Onions, Wethersfield, H. F. Busse, Minneapolis	Second.	1 00
Turnips, William Lyons, Minneapolis	First.	2 00
Turnips, H. F. Busse, Minneapolis.....	Second.	1 00
Beets, William Lyons, Minneapolis.....	First.	1 00
Beets, H. F. Busse, Minneapolis.....	Second.	50
Carrots, William Lyons, Minneapolis.....	First.	1 00
Carrots, H. F. Busse, Minneapolis	Second.	50
Hubbard squash, G. B. Gould, Minneapolis	First.	1 00
Hubbard squash, William Lyons, Minneapolis	Second.	50
Winter cabbage, H. F. Busse, Minneapolis	First.	1 00
Winter cabbage, William Lyons, Minneapolis	Second.	50

PANTRY STORES.

Display fruit in glass jars, Miss Julia Lyons, Minneapolis.....	First.	5 00
Display canned fruit, C. L. Smith, Minneapolis	First.	3 00
Display canned fruits, Miss Julia Lyons, Minneapolis	Second.	2 00
Display jellies, Miss Julia Lyons, Minneapolis....	First.	2 00
Display jellies, C. L. Smith, Minneapolis...	Second.	1 00
Jar mixed pickles, Miss Julia Lyons, Minneapolis	First.	1 00
Jar mixed pickles, C. L. Smith, Minneapolis	Second.	50
Home made vinegar, J. S. Harris, La Crescent.....	First.	1 00
Home made vinegar, C. L. Smith, Minneapolis.....	Second.	50

Sample comb honey, William Danforth, Red Wing	First.	\$1 00
Sample comb honey, William Urie, Minneapolis	Second.	50
Sample strained honey, William Urie, Minneapolis	First.	1 00
Sample Strained honey, William Danforth, Red Wing	Second.	50
Can Cheney plums, J. S. Harris, La Crescent.	Special.	2 00
Ten varieties pickles in jars, Miss Grace L. Smith, Minneapolis ..	Special.	2 00

The meeting then adjourned till 2 o'clock P. M.

AFTERNOON SESSION.

THURSDAY, JANUARY 19, 1888.

The meeting was called to order at 2 o'clock P. M. by President Elliot.

The *ad interim*, or District reports of the Vice Presidents being in order, the following were presented:

REPORT FROM FIRST DISTRICT.

By Vice President A. W. Sias, Rochester.

The fruit outlook in our district is truly encouraging. Messrs. Corp, Somerville, Pond, Johnston, Hoganson, Vine and many others report good crops, and some of them more fruit than in 1886.

STRAWBERRIES.

The introduction of the matchless Jessie adds new vigor and deeper interest in strawberry culture. Hart's Minnesota seedling is panning out much better than we anticipated, its leaves stand nobly against drouth. Mr. Samuel Welch, one of our best gardeners, says it surpasses all others with him. For a late variety we know of nothing better than the Manchester. The Crescent still takes the majority vote.

RASPBERRIES.

Give me the Brandywine for a market berry. It is doubtful if it has a superior as a cooking or canning fruit among red raspberries. The Cuthbert when covered in fall is profitable. Scheffer's Colossal is one of the largest, pretty tart, and not equal to the first named for market.

BLACKBERRIES.

Stone's Hardy fell behind the Snyder and Ancient Briton quite little this year. Why it was not as good as last year I am not able to say. The Thornless was left uncovered again last winter and froze down to the snow line. Cover everything in the blackberry line, and don't forget that the Windom dewberry is rich and good, and can be covered much quicker than the high bush.

GRAPES.

The largest and best grape crop ever grown in the First district was harvested last fall. Everything, even the Pocklington (which is too late for an ordinary season) ripened fairly well. The heaven deposited in this district Oct. 4, 1866, by such men as Col. D. A. Robertson, John S. Harris, Wyman Elliot, Chas. Hoag, and a few others, has been slowly working, till it finally resulted in the organization of the "Southern Minnesota Horticultural Society."

Mr. Dartt presented the following report, as Superintendent of the Experimental Station recently established by act of the legislature at Owatonna:

STATE EXPERIMENTAL TREE STATION AT OWATONNA.

By Supt. E. H. S. Dartt.

Mr. President and Members :

In accordance with the resolution passed by this Society at its last meeting a law has been enacted establishing this station and requiring its superintendent to report to you in person at each of your annual winter meetings. This clearly recognizes you as the best guardian of the horticultural interests of the State, and it empowers you to ask of the Superintendent of this station in an authoritative manner, What are you doing? What do you intend to do, and how do you propose to do it? And since you have the right to nominate his successor he will be very likely to regard your wishes. It will be my endeavor to answer the above questions as briefly as possible keeping in mind the importance of the subject.

For causes beyond my control I was unable to commence actual labor until the fourth of last May. At that time about three acres of land

in an oat field was set apart for exclusively experimental purposes, and placed under my entire control; this has been surrounded on three sides, or nearly so, with evergreen trees eight to ten feet high, trimmed up four feet and set twenty feet apart, which were well cultivated through the season, and though the drouth was severe, yet every one grew, proving the efficacy of cultivation as a protection against drouth.

I had previously sent out postal cards to our leading horticulturists soliciting contributions, and had ordered a small bill from Prof. Budd of Iowa, and one from Robt. Douglass & Son, Waukegan, Ill.

I received a hundred seedling apple trees from P. M. Gideon, and set about two hundred of my own raising and two hundred root grafts of several varieties. These trees, numbering in all about two thousand, covered about a quarter of an acre of land. They were well cultivated, and the ground was sowed to oats in August with a view of securing partial winter protection.

Of trees not yet thoroughly tested in this locality, I have planted the Catalpa, Russian Mulberry, European Alder, Black Cherry, Golden Arbor Vitæ, White-tipped Arbor Vitæ, Little Gem Arbor Vitæ, Austrian Pine, Hemlock, Spruce, Colorado Blue Spruce, Douglass Spruce and Siberian Fir. I have planted seeds of Siberian Larch, Siberian Fir, Nordman's Fir and Norway Pine, which have proved an entire failure, attributable, I think, to late planting and want of vitality in seed. I have also planted small quantities of seed of Duchess, Tetofsky, Dartt's Hybrid, Orange and Greenwood Crabs, Hard Maple, White Ash, Butternut and Black Walnut.

Since entering upon my duties I have concluded that the growing of trees from seed must of necessity become an important adjunct to a successful experimental tree station. So much knowledge and skill is required to grow evergreens, birches and some other deciduous trees from seed, that men have made it a business of itself, and I raise the question whether it is not best to leave this branch to those men and use our energies in other directions.

Of this plat of land nearly one acre had been entirely abandoned to quack, or quack grass, as commonly called by former cultivators. This was broke the first of June, backset in August and dragged many times over. It is expected that plowing and dragging and raking off roots in spring will make it fit for a crop next season, and that very thorough cultivation thereafter will keep it in good condition.

Whilst our main object may be to test trees as to their general adaptation to our climate as it is, yet if we can do anything to either soften our climate or strengthen the trees, it seems desirable for us

to do so. We know that apple trees are benefited by being partially shaded on the south, but we do not know what amount of shade is best, or what other trees would be thus benefited.

It is, I think, generally admitted that it is our long-continued severe cold, freezing our trees nearly dry, that puts them in condition to have the wreck completed by the drying winds, hot sun of spring or summer. Now if we can supply this needed moisture by spraying our trees, or in any other way acceptable to the fickle Dame Nature, we have gained a point. But when and how shall we do it?

It is claimed that insect pests, injurious to trees and fruits, are on the increase, and we know they are very numerous. It would seem that the proper place to investigate and to devise means for their prevention and destruction would be on an experimental tree station. Thus our field for experiment seems to expand in whatever direction we turn.

In addition to the three acres mentioned, there are many acres more awaiting our occupancy. The buildings of the institution are placed on an elevation, and are entirely exposed to the bleak winds and drifting snows of winter, and the hot sun of summer. The management are eager for the protection of windbreaks and groves, and the home adornment of orchard and lawn, and the subject of more extensive timber plantations has received favorable consideration. It is the legitimate work of this station to supply these prime necessities in the shortest possible time.

It is my intention to make this the Mecca of tree worshipers—to form the most perfect arboretum to be found in all the cold Northwest. And I expect to do it by laboring patiently and energetically, guided by your wisdom.

Mr. Dartt also read his report as Vice President:

REPORT FROM SECOND DISTRICT.

By Vice President E. H. S. Dartt, Owatonna.

Mr. President, Ladies and Gentlemen:

The experience of our people during the past year has not increased their faith in fruit growing, especially as regards the standard apple. The effects of our severe winter were not perceptible till spring. Then the Duchess and other trees of like hardiness standing on lowish

ground, and which had been injured by previous winters, died out to such an extent that we are forced to the conclusion that it is useless with our present knowledge, or want of it, to plant even the Duchess in any but favorable localities.

The crab apples have behaved indifferently for many years. Some have died, some bear worthless fruit, others have occasionally borne a fair crop of good fruit, but barrenness has been the rule. If we would restore the confidence of the people we must present varieties, either standard or crab, that will grow in all ordinary situations and bear fruit of fair size and quality and in liberal quantity; or, in other words, we must give them a perfectly reliable, long-lived, productive *fruit tree* adapted to this climate. I have only one variety that I have thoroughly tested and find fully up to this standard in every respect. It is the Greenwood crab. It ripens with the Duchess, and can only be valuable where that variety is not successfully grown. I offer the Greenwood crab as my contribution towards the formation of a reliable crab list.

The fruit crop was nearly an entire failure, caused, I think, by spring frost, drouth and insects. Currants seem to have been destroyed by frost, strawberries by drouth, and apples and plums by the three causes combined. Grapes did fairly well, and I have no doubt by planting early ripening varieties they will be very profitably grown in future.

We will mention a few of our forest trees under cultivation:

The Norway spruce is not quite hardy enough to withstand all the effects of the snow line; the lower branches are frequently injured, but it makes a magnificent tree and promises long life.

The White spruce is more hardy—seldom browns, is of finer foliage and more ornamental while young. Our oldest trees are only ten or twelve years.

Scotch pine is one of our most hardy and rapid growing trees while young, but in cultivated or soft ground it is likely to be blown over, and it becomes less thrifty and more open with age.

White pine will evidently make a fine forest tree, but may require the protection of surrounding trees. With me it needs further trial.

The European larch maintains its reputation as a rapidly growing beautiful tree, but its desirability for stakes and posts does not much surpass the basswood. Whether it will improve with age and the heart wood of large trees will become durable remains to be demonstrated.

The European white birch and the European Alder seem sufficient.

ly hardy, grow rapidly, and take the correct form without pruning.

The soft or silver maple seems to be growing in favor, the only objection being its liability to split down in heavy winds. A little early pruning to prevent the formation of heavy side branches or forks will tend to remove that objection.

The hard maple seems more sensitive to excessive moisture and drouth, and has died out in some cases after attaining a diameter of four or five inches. It needs further trial.

The box elder is losing ground, for though on deep, rich soil it makes a rapid growth and dense shade, yet on poorer soils it is likely to become stunted and is frequently injured by borers.

The butternut and black walnut trees in this section seem to be doing remarkably well, and have commenced bearing nuts in a way that is very encouraging; and the scarcity and high price of the lumber of the latter point to it as one of the most valuable of all our timber trees.

There seems to be two critical periods in the life of all trees. The first we will call the "snow line" period. Here trees are not only liable to be crushed by snow drifts but they are subjected to the greatest degree of cold, often followed by a sudden change to heat, caused by the reflection of the sun's rays from the snow.

The other critical period we will call the period of "expansion." It strikes the apple tree when it is turned out to grass, or when it produces a bountiful crop. And it strikes other trees when we deprive them of those elements and surroundings which their natures demand. When we use all the means within our reach to adjust nature's balance with the greatest precision, then will our greatest successes be achieved.

"Then let us search through Nature's vast domain,
And treasure well each bit of truth we gain.
For Nature's laws but speak the will of God,
Frail man should bow and kiss the threatening rod."

REPORT FROM THIRD DISTRICT.

By Vice President M. Cutler, Sumter.

Mr. President, and Fellow Members:

As usual, I have to report that but few apples except Siberians were grown in our district the past season, and that the crop of crab

apples was lighter than usual, the Transcendent being the only one that bore largely.

Plums were a total failure. Heavy snow drifts broke down many of the red raspberries; those not broken down bore well. Had they been laid down and covered they would not have been injured by the snow.

I had a big crop of Gregg raspberries on a couple of rows that were covered with snow last winter.

My crop of strawberries amounted to over three thousand boxes, mostly on old beds without cultivation. Being on low land the drouth did not injure them.

Stone's Hardy blackberries that were covered bore quite well, but were not first-class berries.

Currants and gooseberries were a failure. Owing to drouth, but few trees set last spring are alive.

Interest in fruit growing is increasing, and we hear of new plantations of grapes and berries being set out. Some of our ladies are appearing in market with fruit for sale.

Prices of small fruits were good, and demand never better. Potatoes were a very poor crop, and are worth one dollar per bushel.

We have heard little of swindling tree agents, and believe with a few amendments the present nursery stock law is a good one, and should be kept on the statute books.

I received about fifty grape vines from the State experimental farm about the twentieth of May, and although the season was very dry, I think all but two or three are alive. Query: Should grape vines be set as late as above indicated, or earlier?

MARKETING BERRIES.

Marketing fruit is of great importance to the berry grower. A poor salesman may have the finest of fruit and make nothing out of it, while a good salesman without good fruit will be in the same condition. So we find that to be successful we must have nice fruit. The berries must be large, of beautiful color, and look fresh and clean. Unless the market is close at hand they should be firm, and picked as soon as ripe enough. If shipped to a distant market they should be picked the day they are shipped. If there are any dirty berries they should be picked, washed, and used at home, or thrown away, but never sent to market, remembering that a good customer is easier lost than gained. Berries should be shipped in neat and attractive pack-

ages and good measure given. Buyers like to see well filled boxes. I have found boxes bought of A. W. Well & Co., St. Joseph, Mich., the best for my trade. I find that few customers know the difference in size of boxes, and believe the small size well filled give better satisfaction than large ones poorly filled. I have generally ordered the large ones, but I have ordered from Minneapolis a few times and got small ones badly mildewed. Boxes should be bought and made before warm weather. If shipped to distant points arrangements should be made with reliable firms before the shipping season opens, or great loss may occur. If you have more at any time than your regular customers will take, do not overstock your home market and reduce the price, but ship the surplus to a commission man and get what you can. The markets are not generally overstocked more than three or four days, and it is easier to hold the market at a fair price than to get it raised after it has once made a break.

Another important consideration is in having the shipping season as long as possible. I find that an unmulched old strawberry bed furnishes the earliest berries, and by keeping the mulch on part of the new bed I prolong the season a few days. And that the earliest and latest berries sell the best.

REPORT FROM FOURTH DISTRICT.

By Vice President N. J. Stubbs, Long Lake.

Officers and Members of the State Horticultural Society:

It is with pleasure that I present you with a few notes on the progress of fruit growing the past season, on the north shore of Lake Minnetonka and vicinity.

Although the past season has been remarkably dry, with the exception of apples the yield was an average one.

Of all our small fruits, the strawberry takes the lead for general market purposes. The Crescent and Wilson are planted mostly. On sandy soil the Manchester succeeds well, and is quite free from disease; the berries are large, uniform in size and very attractive in color, making a valuable berry for market.

Of the newer varieties the Bubach and Jesse are very promising; the plants set last spring that survived the dry weather made a fine growth, showing great vigor of plant, and yielded berries that were large and of good flavor. These varieties are slow of propagation.

The planting of currants has increased considerably over that of other years. The crop was light, not over half a yield, caused by late frosts and dry weather. The white grape currant, with its great shining crystal berries and long bunches, is not well appreciated. I see but few of them on the market, so they command a better price than reds.

Fay's Prolific fruited this past season, is immense in size and moderately prolific; when the price of plants gets to be reasonable, if they prove hardy enough for our climate, they will pay to plant largely.

Downing's gooseberry is a failure with us, on account of mildew. Smith's Seedling and Houghton are good, but unless we can obtain something larger and better than we have yet found in gooseberries, it will not pay to attempt their cultivation.

Ancient Briton, Snyder and Stone's Hardy blackberries have been planted in small quantities, with the intention of bending down and covering with earth to protect in winter; no variety will succeed without this care. A few of the Lucretia Dewberries have been planted, with a fair promise of fruit another season.

There are but few making a success of growing raspberries with any varieties except the Turner, for want of care at proper time and winter protection. Cuthbert stands well, and holds a high rank as a first-class market berry, and yet it has a good competitor in the Marlboro, which with me has proved the most valuable of all. The berries are more nearly round than Cuthbert, and have a deeper red, holding their color to the last; they stand shipping extremely well, as it is quite a firm berry and hangs on the bushes well after it is ripe. We commenced picking Marlow the twenty-sixth of June, and picked the last about the twenty-fifth of July. I believe it to be the most valuable red raspberry ever introduced in the Northwest, especially if it does as well in other localities. We commend it for trial everywhere.

The past season has been a very favorable one for grapes, the yield generally being a good one and quite free from disease and insects. As yet, for market purposes I do not think we have any variety in red superior to the Delaware; in black, Moore's Early and Worden are probably the most valuable. Of the newer varieties that have fruited with me, the Jessica has proved exceedingly valuable, as the vines are very vigorous, free from disease, very prolific and as early as Moore's Early; in quality as good as the Delaware; it is one of the best of white grapes.

REPORT FROM FIFTH DISTRICT.

By Vice President G. W. Fuller, Litchfield.

I am supposed to represent the district in which I live, the Fifth, which embraces the northern portion of the State.

I am also supposed to have a "general impression of the horticultural interests of my district."

In Goodhue county some fifteen years ago there were some fine orchards, but I am told that all the apple trees have failed, excepting a few Tetofsky, Duchess and Wealthy on the bluffs near the river.

I can speak from my own knowledge only of the section west of the Big Woods. And a few words tell the story so far as apples are concerned. With few exceptions, all the large apples and many of the crabs have gone the way of the many varieties, with which our tables were filled in the early days of our Society. The Transcendent is the only real iron-clad, and the only one that has brought and is still bringing steady and permanent returns. The Hyslop is not so hardy, and the trees have nearly all failed. Beaches Sweet has stood and borne well in some localities, but failed in others. The Minnesota is hardy, but does not bear the fruit we look for. I hear of some trees of the Virginia Crab are bearing well in the timber.

In regard to the small fruits, I can speak confidently and hopefully. But here we are confined to the few tried varieties. It does not do to depend upon new things. The cherry and the much advertised Fay currant are perfect failures. An ordinary winter kills them, on my grounds. But there is no discount on the old Red and White Dutch, the White Grape and Black Naples. The Houghton and Downing gooseberry do fairly well. The Somers and perhaps the Philadelphia are the only raspberry that will do anything without being covered, and it is much better to cover them.

I think that in the greater part of this district the true course for us to take is to make no attempt to grow apples except the Transcendent and perhaps two or three other crabs, and give chief attention to currants, strawberries, raspberries, and gooseberries, and confine ourselves to the proved and best varieties of them, and leave the experimenters and theorists to experiments and theories, until some permanent result is obtained.

DISCUSSION.

Mr. Sias inquired if Mr. Dartt would recommend the Duchess except in favorable locations.

Mr. Dartt said on the highest ground in his orchards trees stood best, but he had recently grubbed out several acres of his orchard and seeded the ground to grass, thinking grass more profitable than apple trees.

Mr. Smith. What is the soil on that high ground?

Mr. Dartt. In one orchard there is a strong mixture of sand, but considerable clay towards the south part. I have tried about all the locations in the neighborhood, as well as different kinds of soil. My trees on low ground amount to nothing.

Mr. Pearce. Is the general character of the soil rich or poor?

Mr. Dartt. Some of it is rich and some of it is poor. Along Maple creek some of the knolls are sandy. I have a knoll in my young orchard, but the land produces good crops. The grass kills out trees if allowed to form a sod about them.

Mr. Sias. My question has not been fully answered, as to whether it pays to grow the Duchess?

Mr. Dartt. On my best grounds it has paid; on the poorest it has not.

Mr. Bunnell. But you call your highest ground your poorest?

Mr. Dartt. Yes; but I have made it rich, and there it has paid the best. The best young trees in the neighborhood are in a hen yard; the ground has been greatly enriched and the trees have grown finely; so far I have failed to observe any ill effects from excessive use of manure.

Col. Stevens. I am afraid Mr. Dartt, as usual, takes a too despondent view in regard to his orchard. I was there a few years ago, and he then said, like Mr. Ford used to, that we never could do anything here in raising fruit; but lo, and behold! we found a fine orchard loaded with apples as ripe as could be.

Mr. Dartt. How long ago?

Col. Stevens. Not very long; and since then I have come to the conclusion that Mr. Dartt believes just the reverse of what he says in regard to his orchard. [Laughter.] Another thing; it is well known the European Larch is a beautiful tree and lasts almost as long as the oak. I think he must have the common tamarac instead of the larch.

Mr. Dartt. I have tried setting the larch top down, but it rots off in two or three years. I find it season-checks.

Mr. Pearce. The tamarac lasts with us at Minnetonka better than the white oak. Mr. Douglass gives instances where it has been known to last for fifty years.

Mr. Dartt. That may be with heart wood.

Mr. Pearce. The sap of any wood won't last.

Mr. Dartt. You noticed what I said?

Mr. Pearce. Well, that is a misrepresentation. [Laughter.]

Mr. Smith. How old does it have to get before you have heart wood at will be suitable for posts?

President Elliot. At least eight or ten years.

Mr. Smith. I have tried them that were over twelve years old and they would rot in two years. I understand very well what Col. Stevens means, but there are many things stated at times that do not bear investigation. Robert Douglass is a reliable dealer, but he may have been misinformed.

Mr. Pearce. I think it is poor policy to dispute what Robert Douglass says.

Mr. Smith. It may be poor policy but these are solid facts.

Prof. Porter. May it not be that both these conditions of things may be true? May not the difference in experience in one case be due to the difference in the seasons when the timber was cut?

Mr. Sias. There is another feature of this paper with which I was much astonished. He represents his to be a very trying location; but it is singular that the ash leaved maple will not succeed as well as black walnut. With me the ash leaved maple appears to be perfectly hardy and reliable.

Prof. Porter. There seems to be something peculiar about that location. Black walnut succeeds as far north as the Minnesota river. Suppose he has the most trying location in Minnesota, I found terminal buds of box elder there uninjured and apparently perfectly hardy. I went down there and I found things very much as Col. Stevens described them. I don't know exactly how to account for this except on the theory advanced by Col. Stevens.

Mr. Dartt. I don't like to talk so often, but I suppose if I am on one side and all the rest on the other that you will excuse me. They misstate my paper. I have not said that the box elder died at all.

Mr. Pearce. That is the statement as we understood it; we call for the reading of the paper again.

Mr. Gibbs. All he stated was that box elder was failing on his poorest and highest ground and doing well on good ground.

President Elliot. It does not seem to amount to enough to make much ado about; we must not take too much time.

Mr. Dartt. I stated the box elder was losing ground; it does not have a fair chance, and is not planted as much as formerly. I have

used it as a windbreak, and it has not been a satisfactory tree. It has not grown as rapidly as soft maple, and does not get up much faster than the Scotch pine.

Mr. Pearce. I was surprised last week to find the black walnut thriving at Hutchinson.

Col. Stevens. They thrive and grow by the hundreds along the Minnesota, and between here and Glencoe.

Mr. Brand. In regard to the Duchess I would say there are in this State three localities; I might call them most favorable, favorable, and unfavorable. Mr. Dartt is in the latter locality. Only two or three miles from his house there is a Duchess orchard that is very productive. I refer to Mr. G. W. Buffum's.

Mr. Dartt. I can bear a few hits from these men that are inclined to hold onto the old usages in spite of the facts.

Mr. Pearce. You think you are not guilty?

Mr. Dartt. I plead not guilty, sir.

The Society then proceeded to the election of officers for the ensuing year.

ANNUAL ELECTION OF OFFICERS.

The following list of officers were duly elected:

President—Wyman Elliot, Minneapolis.

Vice Presidents—A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; M. Cutler, Sumter; N. J. Stubbs, Long Lake; and G. W. Fuller, Litchfield.

Secretary—S. D. Hillman, Minneapolis.

Treasurer—Ditus Day, Farmington.

Executive Committee—J. S. Harris, Chairman, La Crescent; J. M. Underwood, Lake City; O. F. Brand, Faribault; F. G. Gould, Excelsior; Isaac Gilpatrick, Minneapolis.

Librarian—E. A. Cuzner, Minneapolis.

Entomologist—Prof. O. W. Oestlund, Minneapolis.

The President was authorized to appoint standing committees, the same to be afterwards announced.

On motion of Mr. Harris an additional committee on Diseases of Grapes was added to the list of standing committees.

Mr. Wilcox suggested the propriety of a committee being appointed or of enlarging the duties of the committee on Nomenclature. He regarded it as very essential for the prosperity of horticulture that a

proper classification of fruits, especially of hardy varieties adapted to Minnesota, should be made.

Col. Stevens said the Society in former years revised the fruit lists each year, lists of hardy small fruits, evergreens, and everything on the catalogue, recommending some varieties for general planting, some for experiment, and others for favorable localities.

Mr. Harris thought it would be well to have such a list as Mr. Wilcox suggested, after the plan pursued with reference to classification of varieties by the American Pomological Society. Such a list had never been published in any of our reports.

Mr. Wilcox said he had been unable to find such a classification, and as he was a new comer here desired to know what were considered to be the hardiest varieties.

The report of the special committee on fruit lists was called for and Mr. Sias of that committee presented the following:

REVISION OF FRUIT LISTS.

APPLES.

For general cultivation—Duchess, Hibernial.

For trial—Autumn Streaked.

For favorable localities—Wealthy.

For general trial—Red Cheeked, Plikanoff, Antonovka, Yellow Anis, Red Anis, Yellow Transparent, McMahon's White, Soiree, Russian Green, White Pigeon.

HYBRIDS.

Whitney, Beaches Sweet, Early Strawberry, Orange, Martha, Transcendent, Florence, Powers.

NATIVE PLUMS.

De Soto, Weaver, Rollingsstone, Forest Garden.

For trial—Cheney, Rockford, and other best varieties to be obtained.

GRAPES.

Worden, Moore's Early, Concord, Delaware, Brighton, Lady.

For trial—Niagara, Woodruff's Red, Wilder, Early Victor.

BLACKBERRIES.

Ancient Briton, Snyder, Stone's Hardy.

RASPBERRIES.

Blackcaps—Ohio, Souhegan, Gregg.

Red—Cuthbert, Turner, Brandywine, Marlboro.

CURRANTS.

Red Dutch, White Grape, Victoria, Long Bunch Holland, Stewart's Seedling.

STRAWBERRIES.

Crescent, Wilson.

DEWBERRIES.

For trial—Lucretia, Windom.

On motion of Mr. Brand the report was received.

DISCUSSION.

Mr. Pearce moved the adoption of the list of apples recommended by the committee for general cultivation.

Mr. Dartt. Mr. President, I don't think we know enough about those varieties to recommend them for general cultivation throughout the State. I am not in favor of recommending any variety that is not hardy.

Mr. Smith. I don't think they are hardy enough.

Mr. Dartt. A tree may bear under some circumstances and in a certain location, and yet be unsuitable for general cultivation. We ought not to make the mistakes of the past; we should recommend only what we know is good and reliable; so if people plant them, in the course of ten or fifteen years they will have something. I move to insert the words, "for trial."

Col. Stevens desired Tetofsky added to the list, as the hardiest apple grown in Minnesota.

Mr. Harris moved to adopt the Duchess for general cultivation.

Mr. Sias. I am quite well acquainted with all these new varieties; I have grown some of them many years. I am satisfied every one of them is hardier than the Duchess. They have been before us for years, and we ought to add a little to the list, although there may be many who would prefer to see it limited to a single variety, the Duchess. We are certainly making little progress.

Mr. Gilpatrick. We are not making progress.

Mr. Sias. Unless we can show some progress we ought to stay at home.

Mr. Underwood. We had better send Mr Dartt as a delegate to Iowa while we get up a list.

Mr. Gilpatrick. I don't want him to go.

Mr. Pearce. I am ashamed of Mr. Dartt. When we say for "general cultivation" we mean, of course, in favorable localities. That applies in every state in the Union; a man who is going to set an orchard, whether in Ohio, Michigan, Illinois or in this State, will not set it where it will be of no value. Put Duchess in favorable localities and it will stand.

Now, those other varieties have stood in most unfavorable places for fourteen years; in one place that I know of where every common variety failed, and are still standing and yielding crops of fruit. One tree yielded six bushels of apples. Put the same tree on favorable ground and it would do much better. I refer to Mr. Peterson; his trees stand on unfavorable ground, and yet they have come through all these test winters and have never killed a particle; and now our friend Dartt has the impudence to get up here and say: "Cut them all off."

Mr. Dartt. Mr. President, I perhaps ought to say a few words. If I have been "impudent" of course it has been in questioning the hardiness or the durability of the larch. I have been called to account for disputing the hardiness of the Wealthy for all localities. Notwithstanding you sent me to Iowa, you have found it to be a fact that its hardiness was at least questionable.

Now, sir, whether we have progressed or not, it is a fact that this Society ought not to recommend one thing to the people of our State they do not know to be reliable, and something that will grow under ordinary circumstances, and produce fruit in sufficient quantities and of a quality to be valuable for cultivation. When that is accomplished we will have established the ends of a reliable list, and by so doing merit the confidence of the people of the State. But if we jump to conclusions for the sake of making people believe we are progressing we are doing what is unwarranted, we will have another setback in the future and the result will do us no good. Impudence! Where is the impudence in telling the straight truth? [Applause.]

Mr. Thompson. Mr. President, I can hardly sit still and keep quiet. It appears that my friend Mr. Dartt is backsliding a little, since I roomed with him at Dubuque; he has changed considerable. I came up here expecting to find some good soil, and I still believe there is. He talks about favorable localities. To cut the story short, if you will set your Duchess on a soil that has bituminous clay for a

sub-soil, or if it hasn't feed it, then if you don't raise good apples just call me a fool.

A gentleman over there is looking this way; I will ask the question and answer it also. Feed it with salt and wood ashes. If you can't get that get salaratus, using a pound to a hundred pounds of ashes, and scatter them around and among the trees. It will have a marked effect on the health and vigor of the orchard. I have tried it on the Duchess and have seen the effects at a distance of thirty feet from the trees. I can increase the size of the fruit one-third by feeding. Another thing; every second or fourth year give your orchard a good mulching with manure that has plenty of ammonia in it.

I would advise my friend Dartt to send to his congressman and get a copy of the report on the geological survey of the Northwestern territory and to read that; to pull off his coat and see what he will find with his book; if he don't find bitumenous clay, or soil mixed with magnesia and carbonate of lime, then you have a wonderful soil. Any farmer with the assistance of that report ought to be able to pick out favorable localities for planting an orchard on his own farm. The best orchard I know of in Iowa is located on land that has a sub-soil of bitumenous clay; it is near Emmettsburg, and is situated on a gravelly knoll. My own orchard is in a similar location

Mr. Harris. I insist on commencing with Duchess, as I am afraid we shall never get through.

The motion to recommend for favorable localities was lost. The motion of Mr. Harris to recommend for general cultivation was then adopted.

Mr. Harris moved to recommend Tetofsky for favorable localities.

Col. Stevens said he was opposed to the motion.

Mr. Underwood said they might as well recommend farmers to sell their wheat in favorable localities. They know very well now what to do, and if they don't, a good, sharp tree agent can tell them. This Society spends a good deal of unnecessary time over these matters of recommending varieties. Farmers don't know whether they want a particular variety, and never will know. It is waste of time to quibble about favorable localities; of course they won't plant trees except in their most favorable localities anyway.

Tetofsky was then recommended for general cultivation.

Mr. Harris. I move to recommend Hibernial for general trial.

Mr. Gibbs. I have understood it has been the practice of the Society not to recommend anything for general trial until a sufficient number had been propagated by nurserymen to supply the de-

mand. I want to ask if that is the rule at present, and if trees of Hiberna can be obtained?

Mr. Harris. My impression is that they can.

Mr. Gibbs. If they can be obtained I want to give an order for some.

Mr. Cutler. I think that is a good suggestion. I notice people give their order for something and if dealers cannot fill the order they put in something else.

Mr. Sias. Last fall Mr. Peterson had them for sale, and I think Mr. Tuttle of Baraboo has them as well as some others in this State.

Mr. Gibbs. If you recommend varieties for general trial and they are not generally propagated by nurserymen in quantities to meet the demand, why these swindling tree agents will put them on their lists and sell to everybody from whom they can obtain an order, filling it with something else; hence you place the people at a disadvantage when you recommend anything for general trial that cannot be obtained true to name.

President Elliot. We are going to have honest tree peddlers after this.

Mr. Gibbs. You will pardon me, I have been away two years and I am a planter.

Mr. Sias. I think this won't have much effect on tree frauds the best we can do with it; we don't need to spend much time on that. These agents have their own lists and they are going to recommend and sell them.

Mr. Brand. I prefer to recommend for planting in limited quantities. Hiberna cannot be found anywhere except in the hands of experts. It has been tried only in favorable localities and for that reason should not be recommended for general trial.

Mr. Gibbs. Pardon me once more. I have reason to believe there is not a bearing tree of Hiberna in the State. Trees usually called Hiberna, for instance those of Andrew Peterson, at Carver, I believe to be Lieby; they have been fully identified as such. Mr. Tuttle is growing true Hiberna. I was the first one to call the attention of this Society to the orchard of Mr. Peterson.

Mr. Sias. I have both the Lieby and Hiberna. I procured scions from Washington, and have compared them with others. Hiberna is the better tree; Lieby has a low top and more of a spreading habit, and to my mind there is a marked difference in them.

Mr. Dartt. How many bushels of apples did you ever raise of that kind?

Mr. Sias. I guess that is a little out of order.

Mr. Gibbs. It is the Peterson trees we are talking about, and the proper thing to do is to recommend Lieby.

Mr. Brand. I saw Mr. Peterson's trees in September. He showed me what he called Ostroloff Glass, Hibernial and Lieby. On a careful inspection I could see no difference in them, or not as much as you will find in a similar number of Duchess.

Mr. Gibbs. He has no doubt followed the labels that he received with the trees. Ostroloff Glass is a small, ordinary greenish apple; the one he calls Ostroloff has large stripes and is a coarse grained apple. There is very little if any difference in the varieties on the grounds of Mr. Peterson.

The motion was lost.

Mr. Latham moved to recommend the Lieby in place of Hibernial for general cultivation. Carried.

Mr. Luedloff was called upon to state what success he had with Ostroloff.

Mr. Luedloff said he had two kinds of trees. They were different from Hibernial. Part of them were received of Prof. Budd. They are the same as Mr. Peterson's, having smooth wood and the same kind of leaf, which is glossy. One kind from Prof. Budd has a sort of woolly leaf.

Mr. Dartt. How many bushels have you ever raised?

Mr. Luedloff said his trees had not borne every year, but they were perfectly hardy. He had thirty or forty Russian varieties that were looking well, while all his old native trees were dead. He had planted about one hundred and sixty of the new Russian varieties.

President Elliot inquired if he had any young trees for sale.

Mr. Luedloff replied that he had, but he said it was not always proper to recommend them. Strawberries may do well in some places and grapes may grow well in the garden, while in other places they may fail. So it is with the apple; one kind of apple may do in one garden and fail entirely in another. When we find a kind that is hardy, that is the kind we want to grow. After all this is experimental work, and every man must experiment for himself.

Mr. Harris said he had received four trees of Ostroloff Glass from Prof. Budd, which had not yet fruited, but they had stood the last hard winters better than anything else he had.

Mr. Dartt. Does it stand any better than Ben Davis at the same age? That variety was apparently hardy when the trees were small. We had some easy winters when I had Ben Davis. I don't believe in

recommending many varieties. I have heard that this variety has been hardy in several places in this State during the last three winters.

Mr. Brand. Prof. Budd sent me some trees three or four years ago, stating that they were the hardiest kinds he knew of, but none of them looked like healthy trees. So far as I know there are no Ostroff trees bearing in this State. The variety which has been taken for that is the Lieby.

Mr. Gibbs. Mr. President, I think I could take two minutes of your time profitably on this matter. The people of Dakota look largely to the reports that reach them from Minnesota and to your recommendations as a Society for direction as to what varieties to plant. The fact of the business is that in all this long list of Russians there is only one variety to be found in the State of Minnesota that has been growing and has been bearing successfully for a number of years, and which remains entirely hardy, and that is the Lieby, and that is being grown under various names. There are some thirty or forty varieties that are being grown in an experimental stage, but there is no more reason why one should be taken up and recommended than any other of these thirty or forty varieties. Mr. Latham has the Lieby that bear well and are hardy. But where can you find another of the varieties received from the Agricultural Department that has proved valuable? At the experimental grounds of Mr. Luedloff and Mr. Peterson the most of these little trees are just coming into bearing.

Mr. Pearce. Do you know anything about Autumn Streaked?

Mr. Gibbs. Nothing more than of about thirty or forty others. In all your reports they have been based on the history of top-worked Russians, and they have been mostly top-worked on crabs. Mr. Peterson, who was educated in horticulture in his native land, proceeded upon a correct basis at the start. He has root-grafted these different varieties and out of the whole department list has only been able to save three or four kinds, and there is nothing but the Lieby that shows entire hardiness after being in bearing for several years.

Mr. Pearce. I think you are in error in saying there is but one variety.

Mr. Gibbs. I mean bearing crops year after year, and a variety that contains elements that justify recommending it to the people for general trial.

Mr. Pearce. I have been watching Autumn Streaked for years and am much pleased with what I have seen of it.

Mr. Dartt. Order; we are not on the Autumn Streaked.

Mr. Sias. I wish to say just a word in regard to these important Russian families. There are a number of varieties that are very similar in character. We have the Anis family, the Transparant family, each containing a number of varieties of very close resemblance, but on close examination we can observe a difference. I have the Yellow and Red Anis and there is very little difference between them.

Mr. Dartt. What about Glass, the one under discussion?

Mr. Sias. I am coming around to the Glass works; it is in the same family as the Hibernial. I do not believe it is the same as that or the Lieby; I admit there is a close resemblance.

Mr. Gibbs. Did you understand me to say that Ostrokoff Glass and Lieby were the same?

Mr. Sias. I understood you to say there was only one variety at Mr. Peterson's, and that was the Lieby.

Mr. Gibbs. I say the variety he refers to as Hibernial is the Lieby. I know Charles Gibb and Prof. Budd identify them as the Lieby.

Mr. Dartt. Strike it out; strike it out.

The motion to place Ostrokoff on the list was lost.

Autumn Streaked was recommended for general trial in limited quantities and in favorable localities.

Wealthy was also recommended for trial in favorable localities.

The further revision of the fruit list was then laid upon the table.

Mr. Brand, of the committee on pine lands owned by the State, presented a report:

PINE LANDS IN MINNESOTA.

By O. F. Brand, Faribault.

Mr. President, and Members of the State Horticultural Society:

Pursuant to our appointment to investigate the extent and quality of pine lands belonging to the State from which timber has been cut, their location and practicability of their protection from fire and their improvement by planting, thinning, cultivation, etc., we beg leave to report as follows:

That supposing the most of the desired information could be obtained at the state auditor's office, I called there in November last, but was informed that no record of such lands was to be found in that office. I then addressed the following letter to the county auditor of each of eighteen counties in that part of the State where the lands under consideration are located:

FARIBAULT, Dec. 26, 1887.

Mr. Auditor:

DEAR SIR: I have been appointed by the State Horticultural Society chairman of a committee to ascertain the quantity of land in this State from which the pine has been cut and the land bid in by the State for taxes. Will you kindly inform me of the quantity of such land in your county, together with such information of its character as you may possess. The object of obtaining such information is to enable us to make recommendations as to what disposition had better be made of it. Whether it would be best for the State to undertake to rehabilitate said lands with pine or other forest trees under a comprehensive system of State forestry, or to let them remain as they are or sell them for what they will bring.

Your figures and advice in the premises will be thankfully received.

Very truly yours,

O. F. BRAND,

Chn. of Com.

In response to this letter I received answers from a few counties where no such land existed, but with the exception of one county no answer has been received from counties in which it was supposed the most of these lands were located, and the answer received gave no information as to the location of the lands, whether in forty acre tracts or otherwise. It is useless, in my opinion, to expect to get information from county officials outside of the regular duties of their office.

It is evident the information sought cannot be obtained without a visit to at least one of the counties where these lands are located, and we would recommend that one of our committee be directed to make a visit to the nearest county (say Pine county) to make a thorough examination of the nature and character of the lands in question, and report at our next annual meeting. The expense would be but little, and the object sought is of grave importance to the State. It might be well to extend the scope of the ground sought to be covered to include recommendations of a general character on forestry.

That some measures should be adopted at once to stop the ruthless destruction of our remaining forests, as well as to measure the present area, is a point on which all intelligent persons who consider not only the present, but the future welfare of the country, are agreed.

When the white men first began the settlement of our State, forty per cent of its total area was covered with timber. In 1880 it was estimated that one-half of the original area covered with timber had been cut off, and still the havoc goes on. We should take warning by

the fate of other nations and countries before it is too late. Portions of Asia, Northern Africa, of Greece and even of Alpine Europe, by the destruction of their timber, have been brought to a desolation almost as complete as that of the moon. At this date it is probable that not ten per cent of the proper agricultural portion of our State is covered with timber.

How much do we need? It is estimated by the best scientists of the age and of past ages that Germany needs 23 per cent of her land kept constantly in timber in order to secure the highest agricultural and healthful returns. When we consider her location, midway between the North Sea, the Baltic, and the Mediterranean, if she requires 23 per cent, what proportion is required by us in the interior of this great continent? No portion of the world more needs the presence of great and numerous forests to preserve an equilibrium of temperature than we. The same causes which produce great and sudden changes of temperature have almost equal effect on the amount of moisture in the atmosphere. Moisture is what we lack in our atmosphere. Prof. Tyndall says: "The removal for a single summer night of the aqueous vapor from the atmosphere that covers England would be attended with the destruction of every plant which a freezing temperature would kill. It may be safely predicted that whenever the air is dry the daily thermometric range, or the difference between heat and cold will be very great."

We all know evaporation is measured in a prodigiously rapid ratio with the velocity of the wind, and that anything that retards the motion of the wind is efficacious in diminishing the exhalation from the leaves of plants and evaporation from the soil. Timber is the only thing we can utilize for this purpose, and then when we consider the large amount of moisture that timber causes to be retained in the soil by rainfalls, mulch, and in retarding the surface water from rapid motion on uneven surfaces we realize that no civilized nation should regard the subject with profounder interest, or prosecute it with intenser energy than ours. Then let us take hold of the subject with a degree of earnestness that shall be commensurate with the important relation it bears to the material prosperity of our State.

DISCUSSION.

Mr. Smith said in order to get definite information as to the amount of these pine lands, it was necessary to go to the different counties where they were situated and make personal inspection of them. This subject was one of importance; it would be again brought before the

legislature. It was perhaps well for the Society to lead in the matter. As to the best thing to be done he could not say, and had no plan to submit. He had studied the forestry laws of Europe, and believed some system of forestry supervision by the State and general government was necessary. It was impossible to get the desired information at the state auditor's office, as these pine lands were largely held by speculators.

Mr. Dartt said it would be a difficult task for any man to visit these sparsely settled districts and make a personal inspection of those lands; one would need camping utensils, and it would be necessary to survey the whole country; to be provided with plats, etc. The scheme was impracticable, at least for the Society to undertake.

Mr. Young inquired as to the class of lands referred to.

Mr. Brand said it was the pine lands that had been cut off and that had reverted to the State on account of taxes.

Mr. Smith thought some law was necessary, providing that such lands as were not fit for agricultural purposes should be reserved for forestry purposes.

Mr. Young thought all the necessary information could be had at the office of the state auditor.

Mr. Brand thought it would be necessary to visit one or two counties to obtain any definite information as to the character and the condition of these lands.

On motion, it was decided to continue the committee another year, composed of Messrs. Brand, Boxell and Smith.

The forestry committee was also continued, Mr. Brand being named as chairman of the committee in place of Prof. McGinnis, who had left the State. The other members are Mr. Smith and Mr. Harris.

An adjournment was taken till 7 o'clock P. M.



EVENING SESSION.

THURSDAY, JANUARY 19, 1888.

The meeting was called to order at 7 o'clock P. M. by President Elliot.

THE NEW ORLEANS EXPOSITION.

President Elliot. I believe Mr. Gibbs wishes to make an explanation in regard to a matter that came up this morning, and he is at liberty to do so now.

Mr. Gibbs. It is simply for the purpose of correcting the record, if it needs correcting. During my absence at the morning session I have understood the question was asked by a member if any account had ever been rendered to the State of the expenditure of the moneys that were raised to collect and maintain the State collective exhibit at the World's Exposition at New Orleans; and some gentlemen who were here and who were connected with the exhibit made the best answer they could under the spur of the moment; but I feared in one or two points they might have misapprehended the facts, and to enable the Secretary to get them in the official report, I will answer the question, and also another question that came up.

The itemized vouchers for all expenditures were returned to the Governor of the State, under whose instructions all the work was done, and were duly audited at the close of each month and turned over to the State Auditor; and when the Exposition closed the matters that remained unadjusted were finally closed up, and all vouchers bearing the governor's approval were turned over to the State Auditor, and I presume will appear in the auditor's published report. So far in regard to that.

Then the question arose, as I understand, in regard to the preparation of the commissioner's report upon the subject. I left the State and changed my residence some four or five months after the close of the Exposition, but during all the time I was here I was anxious to and did proceed to make a report, but was unable to do so on account of the delay of two or three parties—who had important employment in connection with the exhibit to submit—to present and furnish their reports which would be necessarily parts of mine. Our failure to receive those reports has prevented the preparation of the complete re-

port up to this time. I am happy to state now, however, that matters are under way, under the instructions of the present governor, and with the aid of ex-Gov. Hubbard, to have a report prepared on that exhibit, and one that will be commensurate with the character of the exhibit itself, which you all remember was regarded as being as fine a State exhibit as there was in the Exposition, if not the finest of all. That report will undoubtedly in a very brief period be prepared and turned over to Gov. McGill for such action as the next legislature may take in its wisdom on the subject. But I presume it will be published with the proper illustrations, and citizens of the State will be more pleased with the report itself than with the subject.

If the Secretary would now place his pencil upon his ear he would like to state a further fact. He understood the Society had received \$50, 'as premiums awarded on fruits, and some were no doubt surprised at receiving that money.

In the State exhibit there was some two hundred bushels of apples and a quantity of grapes. In his judgment they could not compete successfully for premiums; therefore no attempt was made to exhibit apples at horticultural hall, where competitive exhibits were made; reserving them to go with the State exhibit in other buildings.

On grapes we had a fair show to make good our pretensions for growing as good grapes as can be grown anywhere in the United States, and several entries were made in the name of the Society, and a number of premiums afterward awarded.

He was very glad the Society had received the money, and the whole United States would share with them in the honor, for in contesting for the palm in choicest varieties they had secured these awards on fruits it was not supposed could be successfully raised in a cold climate.

The report of the committee on floriculture being called for, the following paper was then read:

ARCTIC FLOWERS.

By Mrs. C. O. Van Cleve, Minneapolis.

The mercury sinks in the bulb, men and women hurry along the pathways between walls of snow, as if pursued by some invisible but dangerous foe, and sitting down to write of flowers, I look out the window at my flower bed of last summer and behold a white, shapely mound, beautiful, but oh! so cold! It is the grave of my pretty cypress vine and sweet mignonette, my velvet pansies and bright ver-

benas, and other beauties that I loved; and I could weep, but that I know the spring will come by and by, the snow will melt, the sun will warm the earth, and my garden will bloom again in fragrant beauty. Rejoicing in this hope, there comes to me the thought, "How do people exist in the Arctic regions, with snow and ice and cold always about them? Are their hearts ever warmed and gladdened by the sight of flowers of any kind?"

Our ideas of the inhabitants of the Frigid zone were very vague, and we knew very little of their mode of living, their pursuits, etc., until modern travelers and scientists visited these regions and enlightened us in regard to them. Some have given glowing accounts of the peculiar beauties of those cold countries, and have awakened a strong desire in the minds of many to visit them. Standing in the art gallery at the Exposition, last August, before one of Mr. Bradford's inimitable pictures, more than one enthusiast might have been induced to enlist for an expedition to the North Pole, but the month of January in Minnesota is not a favorable time or place to obtain recruits for such an adventure.

Frederick Schwatka, the explorer, has given as the result of his Arctic voyages, some very interesting accounts of the flora of the extreme north. He says: "The Arctic waters, full of floating ice the year round, make the shores comparatively devoid of vegetation, except a stunted water sedge that is as hardy as the Canada thistle, and perchance a few straggling polar blossoms peeping through the moss, that seem strangely incongruous in the icy surroundings of general desolation, but, inland, the never setting sun, though seldom high above the horizon, can constantly accumulate its heat unobstructed by any loss at night, until it produces a vegetation in the little valleys that seems almost tropical when compared with the desolation that greets the eye in every other direction."

One of the most interesting considerations of Arctic flora is its origin, as given to us by that great pre-historic printing press, the fossil strata of the earth, and especially the revelations of what is called the nival flora of the non-frigid zones, or that which is found at high or Alpine altitudes, among climates similar to the polar region. During one of the geological periods, and not so very far back in the world's history either, a great sheet of thick ice crept down from the base of the north pole, and extended in many places half way across the temperate zone. Arctic weather prevailed to the tropics, and all the surroundings were in accord, even the plant life being only of that hardy, stunted kind that would resist such intense cold. But after a

while the earth got over this chill, and the great sheet of ice started to recede to its home in the north; and along with it went all the Arctic life, plants and animals; willows and walrus; moss and musk oxen. But the northward direction was not the only line of retreat left open to these refugees of the cold. They could also ascend the mountains and find the climate which they loved if they were only high enough, and this they did, even within the tropical region, and when the Alpine climbers ascend the snow-clad mountains of picturesque Switzerland and gather a pretty little bouquet of a dozen different nival flowers, on that barren zone, just before the perpetual snow and ice is reached, half of them will be of the same variety that some polar explorer has gathered that season, in the land of the midnight sun, to store away in his herbarium for future reference. One of the most prominent botanists who has studied this peculiar nival and polar flora was Professor Oswald Heer. In making a study of the nival flora of Switzerland he found 337 species of flowering plants at Alpine height, that is between 8,000 and 13,000 feet above the sea. Only one-tenth of these comprised species belonging to the lowlands of the surrounding country, while about one-half of these plants originated in the Arctic but had come from Scandinavia with the ice of the glacial period, and had been left stranded on the Alps, when the ice receded, as a floating object is left by the ebbing tide. And this word "ebbing" is not a bad one to use, for there are scientists who believe that centuries from now this great sheet of ice will come again, and again recede ebbing and flowing in the life of the world as the ocean's tides do in ours. Therefore only two-fifths of the flowering plants of the Alps are strictly natives of the region they occupy. With a few wolfish dogs tied to a sled and a reindeer or two in the distance, an Alpine climber could easily imagine he was in the "great white zone." I feel like moving that a vote of thanks be given to the learned men alluded to above, that they have placed the next advent of the glacial period so far in the future that this horticultural Society, and all its immediate descendants will not be seriously incommoded by it.

An English botanist states that the tropics have from 40,000 to 50,000 species of plants, the north temperate zone about 20,000 species, and the Arctic 1,000 or less, with some 2,000 among the Alpine flora, or about 3,000 species enjoying (?) an Arctic climate. Small as this number is, it is sufficient to do away with the popular opinion that the polar regions and snow-clad mountains are practically devoid of vegetation. A fact that may surprise some is that while in the Arctic there are 762 kinds of flowers, a flowering plant has never

been found within the Antarctic circle. This may be because there are very few tracts of land there of any extent, and there is, in fact no inland where the sun's rays can be absorbed and used for warming and vivifying the earth.

Of the seven hundred and sixty-two kinds of flowering plants in the Arctic, only fifty of them are wholly residents of that zone, and very few of the flowers that blossom in that chilly region have any perfume.

The colors generally are of the cold tints, white and light yellow predominating. In the depths of the ocean are found the largest and most vigorous specimens of plant life, such as colossal kelps and similar life that grow throughout the year. Nearly all the plants in these cold regions are biennial or perennial; the seasons are too short for annuals, and these perennials begin to push their growth through the snow at the first cessation of the vernal cold.

Mr. Schwatka says he has seen flowers in bloom on King Williams Land so close to the snow that the foot could be put down and leave an impression on the edge of the snow and crush the flower at the same step. And Middendorf, a Siberian traveler of note, says he has seen a rhododendron in that country in full bloom when the roots and stems of the plant were completely incased in soil frozen as hard as a stone.

Among the useful plants found in the Arctic are the Scurvy grass, a rough, cruciferous plant that is famous as a cure for the terrible disease from which it is named, and Barley; and so rapid is the growth of this last named plant, that, in seasons at all favorable, it is ready to cut two months after sowing, and two crops are raised in one season.

Besides the plants alluded to, which are similar in habit to those in more favored climates, there is another kind that seems to love to burrow and spread their species in and on the bare snow and ice itself. And naturalists have succeeded in separating forty-two species of purely snow and ice plants from the many they have examined. All of these require the microscope to determine what they are, and nearly all are of a rich crimson or some of the tints of red, which would look cheerful if it were not for the suggestion of splotches of blood on the snow. Agassiz thus describes these singular plants as seen on the Alps: "The deep repose, the purity of aspect of every object, the snow broken only by ridges of angular rocks, produce an effect no less beautiful than solemn. Sometimes in the midst of the wide expanse one comes upon a patch of the so-called red snow of the

Alps. At a distance, one would say that such a spot marked some terrible scene of blood, but as you come nearer the hues are so tender and delicate, as they fade from deep red to rose, and so die in the pure, colorless snow around, that the first impression is completely dispelled. This red snow is an organic growth, a plant springing up in such abundance that it colors extensive surfaces just as the microscopic plants dye our pools with green in the spring. It is an Alga (*Protocotis miralis*) well known in the Arctics, where it forms wide fields in the summer."

This same high authority who seems to find beauty and fitness everywhere, says: "There are valleys in the Alps far above six thousand feet which have no glaciers, and where perpetual snow is seen only on the northern sides. These contrasts in temperature lead to the most wonderful contrasts in the aspect of the soil; summer and winter lie side by side, and bright flowers look out from the edge of snows that never melt. Where the warm winds prevail there may be sheltered spots at the height of ten or eleven thousand feet, isolated nooks opening southward where the most exquisite flowers bloom in the midst of perpetual snow and ice; and occasionally I have seen a bright little flower with a cap of snow over it, that seemed to be its shelter. The flowers give indeed a peculiar charm to these high Alpine regions. Occurring often in beds of the same kind, forming green, blue, or yellow patches, they seem nestled close together in sheltered spots, or even in fissures and chasms of the rock, where they gather in dense quantities. Even in the sternest scenery of the Alps some sign of vegetation lingers, and I remember to have found a tuft of lichens growing on the only rock which pierced through the ice on the summit of the Jung-frau. It was a species then unknown to botanists, since described under the name of *Umbellicarus Higinis*."

And now it would be very delightful if those who have listened patiently to this dissertation on Arctic flora, could step from this hall into one or other of the beautiful greenhouses of which our city has a right to feel proud, and as their eyes feasted on the tropical beauty to be found there, they might be led to think that there are, all over the world, not excluding our own highly favored city, many who are sick and wretched, and, wicked, it may be, whose lives have been very dreary and barren, around whom no sweet tender influences have been thrown, and who have little or no hope for this world or another. And with that thought might come the impulse, to do something to brighten and make better these sad lives. From such an impulse as this has grown the Flower Mission, and the good it has ac-

complished will never be fully known or realized in this life; it is like sowing seed which is to spring up and bear blossoms that may never perfectly unfold here, but which in that heavenly clime where there is no frost or snow, or chilling winds, will open up in loveliness and beauty of which we cannot now conceive. Some years since a city mission was established in the city of St. Petersburg, Russia, which was to labor in various ways to elevate the poor and wretched. One special work given the ladies to do is visiting the hospitals and carrying comforts of various kinds to the sufferers. It is narrated of one who had been on this errand of mercy, and was returning with an empty basket, in which she had taken flowers to brighten the sick rooms and cheer the weak ones, that in passing a church she found a poor girl asleep on the steps. Her basket was ransacked for a single flower; the result of her search was one modest violet, and this she laid on the bosom of the sleeping one. The girl had worn such a violet as she received the parental blessing when, two years previously, she had left her father and mother for service in the distant city, where, alas! she had fallen before the force of temptation and had become a poor soiled daughter of the street. On waking the unexpected flower stirred all the old tender associations, which ended in the resolution: "I will arise and go to my Father," and in his boundless love she found peace and a Savior. And she who did so small a thing for the Master's sake may never know in this world the result of her loving act, but what a glad surprise awaits her when in the "beautiful home over there" she greets among the redeemed ones the sinful girl who lay asleep, alone, in that great city and waked to newness of life, through the instrumentality of a simple heart's-ease laid on her bosom by the hand of a pitying, loving sister. Such illustrations of the salutary influence of flowers prove that they have not been created exclusively for our own personal gratification, but that we may share them with others, for their cheer and encouragement, and adding new zest to our floricultural studies make us feel that they are well worth the time and labor we devote to them.

On motion of Mr. Harris, a vote of thanks was given Mrs. Van Cleve for her able and interesting paper.

FLOWERS AND ROSES.

By Mrs. M. S. Gould, Excelsior.

God's first and best gift to man was a garden, in which everything was not only "good for food," but "pleasant to the sight."

The love of beauty in nature is natural Heaven-born. It can be said of flowers, says Dr. Tuttle, but scarcely of any other thing, that they are universally admired. There is no time or place where they are inappropriate, no decoration to which they cannot add a charm. They lend fragrance and beauty to homes of joy and to homes of sorrow. They may tell our love for the living and our mourning for those who have passed away. There is no private meeting of friends, no public festival, nor anniversary of any kind which they may not embellish or grace with some sentiment. They make crowns for children and chaplets for heroes; and our nation could find no more delicate, genuine way of expressing its gratitude for the soldiers who perished in the late war than by covering the places where they sleep with flowers."

It has not been my lot to have much leisure or strength to devote to the cultivation of flowers. But as we have always been blessed with a few, hoping I may help someone less fortunate than myself, and that I may encourage someone who has never tried to raise them, or those who "never have any luck" to try once more, having in remembrance bare and desolate homes in "this broad land of ours," and agreeing with Mrs. Van Cleve that it may be a part of our duty as a horticultural Society to implant and foster in the minds of our youth a love for the culture of plants, I will mention a few of the most hardy which may be grown with the least possible labor:

Perennials come first in the list of easy culture, requiring very little care if properly planted.

Annuals necessitate more labor, the ground needing to be prepared *every* spring, and *early*, just when the busy farmer is tempted to reply to such requests, "Yes, by and by; can't do it now; wait till I get over my rush." Could fathers and brothers always realize the blessings these God-given treasures are, they would probably oftener contrive in some way to lend the "helping hand" to provide something "pleasant to the sight."

Gov. Colman once said, while urging this duty: "Grow flowers; they are elevating, purifying, harmonizing in their influence upon the character of yourself, your wife and your children. The farmer who

does not cultivate flowers, or encourage it, does not do his whole duty to his family."

And Miss Shore writes: "The most humble home may be brightened and its coarse surroundings made attractive by flowers. A neatly kept border, or a bed gay with blossoms of even the commonest varieties are certainly more pleasant and restful to the tired wife and mother than an untidy grassless yard, with fences down and pigs, calves, and geese roaming at will, as seen so often in the country. Half the time taken to keep them out would be amply sufficient to cultivate a few flowers.

If it should happen in any family that the willing hands are not strong, and the strong not willing, it is doubtful if more than a few annuals and hardy perennials should be undertaken.

And although it is pleasant to try something new occasionally, it seems wisest to depend mainly on those tried and proved varieties from which we can with confidence expect a reward of almost constant bloom, old, and yet ever new, delighting us continually with their beauty and fragrance.

The following varieties I would recommend by experience and observation as best adapted for those of little or no experience:

Phlox Drummondii, Chinese pinks, sweet peas, pansies, sweet alysum, verbenas, asters, nasturtiums, candytuft, petunias, balsams, larkspur, ten weeks stock, mignonette, and portulaca. Some of these, phlox, petunia, portulaca, and larkspur are self seeding, and labor can be saved by using the same bed, transplanting occasionally in the spring.

For a new beginner I would advise trying only a few varieties. Those wishing more can easily select from the many seed catalogues, nearly all giving directions for planting. If the necessary amount of earth cannot be spared or prepared for annuals try a few perennials. Phlox of many beautiful shades of color; bleeding heart and peonies—hardy, vigorous, and many of the new sorts delightfully fragrant—are improved by cultivation, but will spring up and bloom cheerily if neglected. I will also add the hollyhock (again in favor), in situations for tall flowers we know of nothing better. Vick says: "There are few plants whose flowers so perfectly combine large size and delicacy, quite as double and almost as pure and perfect as those of the camellia." I sometimes think this favorite old flower one of our best perennials. And tulips,—everyone who lives where the winters are so long and cold should have a bed of tulips, they bloom so early. Their visit is short, I confess, but other plants may be set between them so the bed may

not be left bare after they have faded. We have always used petunias for this.

Lastly but by no means least, the rose; the most delightful and queen of all flowers. I am thankful there are a few hardy varieties all may have. The choice and tender ones are worth trying for, though they require careful and skillful treatment. I believe nothing has so many enemies; among the most formidable we have found the aphid, rose caterpillar, bugs and spiders of various kinds, and mildew. Constant vigilance is the price of success.

Rose culture is comparatively a new industry in our family, in which, I confess, there is much for me to learn. Will mention, however, a few (from over one hundred varieties we have tried) which I believe, everything considered, have given best satisfaction, and which may be grown out doors in Minnesota if well protected during the winter.

Gen. Jacqueminot, Fisher Holmes, Louis Van Houtte, Baroness Rothchild, Mabel Morrison, Countess of Serenye, Eugene Verdier, Caroline de Sansel, Alfred Colomb, Salet Moss, Eliza Boelle and La France. Gen. Jacqueminot we value for its beauty, fragrance and hardiness. Fisher Holmes has been described as an improved Jacqueminot, and is, in my opinion, in some respects its superior, the petals having a little more substance, and in sunlight I think the color more beautiful. Of the three varieties, Louis Van Houtte, Fisher Holmes and Jacqueminot, Mr. Gould's choice is in the order named, Louis Van Houtte coming first, but for *evening* decoration the Jacqueminot is always preferred. We consider the Alfred Colomb a valuable rose, being fuller than the Jacqueminot and a better bloomer, giving more blooms late in the season, but not quite so beautiful in color. Baroness Rothchild and Mabel Morrison, though shy bloomers, are so exceedingly beautiful (also hardy) we would not willingly spare them from our list.

Eliza Boelle, white, dwarf habit, is a very free bloomer all through the season.

Gen. Washington, is a free bloomer, but the flowers are often imperfect; when perfect, a fine sort.

La France (Hybrid Tea), a delicate, silvery pink, large and fine, a most constant bloomer, considered by some as the sweetest and most useful of all roses.

Our Teas, Perle des Jardins, Sunset and Bon Silene, were greatly admired for their luxuriant growth and beautiful and abundant bloom.

The attempt to winter them out doors is an experiment; the result we consider extremely doubtful.

To any rose lover who indulges in luxuries, I would recommend these, even if they must be bought at the greenhouse every spring.

What I would give as the "key to success" is good, thrifty plants well planted, and *carefully tended during summer*.

I might add that this care is not altogether pleasurable, viz.: the battle with the rose enemies, but then I suppose we all expect "thorns with roses."

Mr. Sias moved a vote of thanks to Mrs. Gould for her valuable paper, and that it be placed on file for publication. Carried.

The following paper was then read:

AN AMATEUR'S FLOWER GARDEN.

By Frank H. Carleton, Minneapolis.

When your President asked me to say a few words upon an "Amateur's Flower Garden" my first impulse was to say "no," for I felt that I should make a sorry appearance alongside of many of the members of this Society. But the second thought came to me, that there is not sufficient interest in the healthful and delightful pastime of cultivating flowers, and so at the risk of being tedious I will relate a little of my own experience as an amateur cultivator of flowers.

Five years ago I could scarcely tell the difference between a Petunia and a portulaca. At that time my wife, in early spring, asked me to bring home a package of sweet alyssum seeds. As a matter of duty I obeyed, but I purchased the seeds with even less interest than a person usually displays when he purchases a box of matches. A few evenings later, by dint of much persuasion, I acted as a sort of listless laborer, and under strict surveillance and frequent urgings, made a small flower bed, in which the seeds were planted. I was not at all interested until the little things, in the course of about ten days pushed their tiny plant leaves through the soil. The process of growth interested me. Why did they grow and how? Whence came the life? And a multitude of questions which will never be answered until we get into the presence of the Giver of all life, forced themselves upon my mind. As the weeks passed by and a multitude of blossoms un-

folded each day with fresh fragrance, my interest increased and the love of flowers was born in my heart.

When next season came no one had to ask me to purchase seeds. Early in the spring evenings I was busy with the seed and plant catalogue. The close confinement indoors of my profession was telling upon me, and I determined to try a little amateur gardening for my morning and evening exercise. So I divided my tract of land in the middle—the rear part for vegetables, and the front half for flowers. I will not speak of the fresh tomatoes pulled for breakfast, even while the breakfast bell was being rung, or of the crisp lettuce, or of the early pea—sweeter than any sugar, whose very freshness gives appetite to an invalid, but I will pass on to my flowers. Of course I made some mistakes the first season. I sowed many of my seeds too closely and did not weed sufficiently. I sowed nasturtiums and bachelors buttons in rich soil and got immense and vigorous plants, but no blossoms. I sowed asters in dry soil and got a few pinched up flowers. One cut worm would prematurely harvest a dozen plants and go undisturbed and grow fatter and fatter. But this was only for one season. I discovered that plants are as sensitive almost as human beings. It won't do to treat all alike,—if you do, some get angry and rebel. Some flowers, like the asters, and stocks, and pansies, are aristocratic, and want rich soil,—plenty to drink and plenty of sunlight,—others like the nasturtium and portulaca can't stand luxury. They want a poor soil and thrive better the drier they get. But all flowers are alike in one respect. None of them can stand weeds.

There is no place in the Union where annual flowers do better than in Minnesota. It is true that there are many states whose seasons are longer, but in none does nature do a better work in a short time than here. Annual flower seed grow quickly here, and flower quickly; and for the past three seasons my flowers have had their full period of blossoms and have gone to seed before the frosts came. The rapidity of growth here fully compensates for whatever we may lack in length of season.

I desire to dissent from the common view that hardy roses will not do well in Minnesota. They do better here than in Indiana or Illinois. It is true that our winters are somewhat severer; but it is the alternate freezing and thawing weather of early spring which injures the rose bushes and hollyhocks and other hardy plants, and not the steady cold weather of mid-winter, when they are protected by a mulch. Many a rose bush will pass unhurt through the severe weather we have been having since Christmas, and finally perish by being

uncovered too early in April. The open winters of Indiana and Ohio are not as good a protection to the rose bush as the heavy snows of our State, which come and stay until spring. In all the northern states mulching is necessary, and no more here than elsewhere. In mulching, however, care should be taken not to mulch too heavy, so as to exclude all air. Roses and hollyhocks and pansies and Chinese pinks (the dianthus) can easily be kept through the winter by a mulch; but the mulch should be loosely thrown on and a little air admitted; and the mulch should not be removed too quickly in the spring.

Rose bushes need pruning. I got my first lesson in this three years ago. On my lawn was a very handsome *Jacquinot* which had weathered several winters and was immensely large, several of the branches being taller than my head. One spring evening the worthy President of this Society chanced to call. I pointed with pride to my bush. He shook his head. He simply took out an immense pocket knife and said nothing. But he slashed away at that rose bush, and the old shoots flew in all directions. That bush was a sorry sight when he got through with it. I felt bad, but smothered my grief. My grief, however, was soon turned to joy, as the new branches shot forward like arrows, and the multitude of blossoms in due time made it a marked object on the lawn. In this connection I might also add that many who raise flowers are too chary in cutting the blossoms. The more flowers you cut and give away the more you have. One flower in going to seed will take the vitality out of a score of blossoms. Never let a seed pod form. It will rob you of many blossoms. The best seeds are so cheap and accessible that no amateur can afford to raise them. I know a rich lady who, in order to raise a few seeds for the coming season allowed her early blossoms to go to seed and seriously curtailed her entire crop of blossoms, when five cents would have purchased all she wanted for the next spring. She saved her nickel, but practically lost her whole crop of sweet pea blossoms for the season.

It never pays for an amateur to raise seeds. The choicest seeds are now very cheap. The flowers should be picked as fast as they blossom (excepting of course the geranium blossoms on the lawn). Not only is it true that the more we pick the more we have, but it is also true that in the hands of an amateur the seeds will gradually degenerate. For this reason I always buy fresh seeds every year from a reliable house. The only exception to be made is in the case of the old-fashioned balsam, which has been improved so much in the last

few years as to be almost equal to a rose. Most flower seeds lose much of their vitality in a season or two, but a balsam seed ought to be two or three years old to give the best results.

But let us pass from general remarks to certain flowers. I will not pause to speak of geraniums, and heliotropes, and hot house plants, because we generally buy these plants of the florist; but first let us speak of some of the annuals, the old-fashioned garden flowers, which delighted our youth and were cultivated in the days gone by,—the aster, ten weeks stock or gilliflower, sweet pea, hollyhock, “youth and old age” as the Zinnia was once called, the “ladys slipper” or balsam, the pansy. etc. Within the past ten years all these have been greatly improved, and like most everything else specialists are at work each year improving the strain, and the same genius which has developed the dahlias and fuschia and gladiolus from what were once practically wild plants or weeds into the rich varieties which we now have, has also developed new beauty in these flowers.

First of all flowers, both for its beauty and constancy of bloom, I would name the pansy. For a few early blossoms it may be well to buy a dozen plants of the florist, but these from being “forced” at the green-house soon dwindle away. It is very easy to have fine large pansies through the entire summer season. As soon as the weather will permit, plant the seeds. They are slow to germinate, taking from ten to twenty days, but afterwards grow rapidly. When you transplant them into their permanent place do not be afraid of the sun,—they do well in the sun providing the soil is very rich and they have plenty of moisture. Some say pansies want shade. This is not my experience. They want a rich clayey soil and a great deal of moisture. But any rich soil will do, providing an abundance of moisture is furnished very early in the morning and after nightfall. The only benefit pansies derive from shade is from the moisture which shady locations give, and by a little care, according to my experience, larger and finer pansies can be raised in the sun than in the shade. But in buying seed get only the very best. The new shades of red and mahogany and bronze, and the solid single colors are fast taking the place of the common kinds. Indeed the pansy is the only flower which seems to transgress the rule that there is no family of plants in which blue, yellow and red in varieties of the same species, are found.

Next among annuals in point of beauty to the pansy, in my judgment, is the aster. It is a royal flower; many of its varieties, as for instance the Victoria and Truffaults peony flowered are unsurpassed.

this too must have a rich soil and plenty of moisture. Then comes the ten weeks stock or "gilliflower," and scabiosus or "mourning bride," and also the gailardia, of brilliant hues, also requiring a rich soil and moisture. And right here, speaking of plants which require moisture, let us remark that many do not know how to water plants. They sprinkle them. Now this is wrong. Sprinkling as it is generally done with a hose or sprinkler, generally wets only the surface of the ground, which causes the plants to send out many little surface roots, which are soon burned or dried up by the sun. When you water most plants the soil should be thoroughly drenched or saturated. One good drenching of the soil in which the water thoroughly saturates the ground, is worth half a dozen ordinary sprinklings.

There is no more fragrant flower in the garden than the sweet pea; and no bunch of flowers gives more beauty than an immense mass of sweet peas, whether it be on the sideboard as a bouquet or worn as a corsage flower. Many fail in raising sweet peas, and yet they are easily grown in great abundance. First of all they should be sown just as soon as the frost is out of the ground,—as soon as the soil can be worked. Don't wait for pleasant weather or be afraid of frosts, but put them in as soon as the soil can be worked. The richer the soil the better. The rule as given in the books is to plant them four inches deep, but experience has demonstrated a better way, as they often rot or fail to come up when under four inches of heavy spring soil.

They should be planted in double rows, the rows being about six inches apart, and the peas about an inch apart in each row. If they are at the outset planted four inches deep many will not come up, so I believe a better way is to dig a trench or hollow space about five inches deep, and then sow the peas and cover to the depth of an inch or so. Then as the peas grow gradually "hoe in" from time to time, until the hollow or trench has become even with the soil. In this way the roots which form from the germination of the pea will be four or five inches below the surface. As soon as the peas are up two or three inches, put up your frames for them to run upon. Their future success depends upon their being furnished with an early support.

Hollyhocks are again coming into fashion. Many of the double ones are equal to dahlias. When once in a garden they will seed themselves, and a clump of them gives a rustic beauty to any garden or lawn.

But I find my time is passing, and I have not yet alluded to that

grandest and richest of all summer flowering bulbs,—the gladiolus. There is nothing in the garden which requires less care than gladioli. They are raised easier than potatoes, and nothing will attract the eye of the passer-by so quickly. When the bulbs are once in the ground you have nothing to do but keep the weeds out and cut the flowers when they come. It is true that the bulbs are somewhat expensive at the outset, but they multiply rapidly, and if a person will save the little bulblets which form at the base of the large bulb each year, and plant them in separate drills, he will soon have a great abundance. I procured about a hundred bulbs of the named varieties three years ago, and I now have in my cellar about three bushels of bulbs for this spring's planting. If a person does not want to go to expense of buying bulbs let him buy a package of seeds, and many of them will blossom the second year, and from that time onward if he saves the bulbs and bulblets he will have plenty.

But I fear I am trespassing too much upon your patience, and with a brief statement of how I handle cut worms I will close. Of course if a person goes into the garden in the early morning and sees a plant has been cut by the worm at night he can usually find the worm within an inch or so of the plant and destroy it. This is a safe and sure way. But a couple of seasons ago I chanced to leave a small pile of grass which had been cut by the lawn mower in the garden. The next morning in removing it I found several cut worms under it. Whether attracted by the odor of the fresh grass, or not, I will not undertake to say, but they were there, and so now I regularly set this trap for them each spring and generally get a quantity each morning. Somehow the freshly cut grass draws them together.

I thank you for your kind attention to this hastily prepared paper, and in closing I submit whether there is any diversion more productive of health or cultivating to the taste, or where a person can get nearer to nature than by cultivating those flowers which God gives to all as a common blessing? Here nature smiles equally upon the humble and the wealthy, and a little industry is rewarded with gifts which decorate any home.



THE CLAIMS OF ENTOMOLOGY AS A DISTINCT SUBJECT OF STUDY.

By Prof. O. W. Oestlund, Minneapolis.

The number of different kinds of insects now in existence is great, we would almost say innumerable. Their relation to man are manifold, and often of greatest importance. If all insects should at once become destroyed and the work that they now perform left undone, we know that the earth would soon become uninhabitable, at least to man and higher animals. Insects do not exist only as a matter of chance, or perchance to torment us if we become too wicked, or to blast our hopes by destroying the results of our work, as we would often like to believe. Their existence has a deeper significance than this. These small creatures, to which I would now call your attention for a few moments, found everywhere where man has yet put his steps, even to the ice-bound shores of the northern seas, seem to embody the very principles of vitality, activity and destruction.

VALUE OF INSECTS.

One of the most important and far-reaching results of their work is probably as scavengers. As soon as an animal falls dead to the ground, or any other animal matter becomes exposed, these little animated beings, which are ever on the alert, are at once ready to bounce upon it, tear it to pieces, bury it under ground, devour it, and soon again to change it to living animal matter. The great naturalist Linnæus used to say that a pair of blow-flies are able to devour an ox as soon as a lion. If you have observed these flies hover around a carcass, depositing their innumerable eggs, which will soon turn the object into a living mass of maggots, you will not only see the force of the assertion, but become greatly amazed at the rapidity with which nature is able to do away with a putrifying object that would only give off poison and death to every living object in the vicinity; and in place millions of flies are produced, which in turn are ready to perform the same duty as they may be called upon. Not only are the softer parts of the carcass that would first putrify immediately taken in charge by certain species, but even the hide, the hoofs and firmer portions of the body are all in turn attacked by other species, and soon nothing will be left but the dry mineral portion of the skeleton, which is now turned over to the sun and air to further disorganize at leisure, but now without any evil effect upon living beings. Not only

on land do insects perform this important work, but also in water. It is insects, together with other important classes of animals, that keep the water of our lakes and ponds clear and in motion, which otherwise would soon become stagnant and foul from accumulating filth and vegetable matter, and make it utterly worthless to man besides filling the air with foul gases.

The relation of insects to vegetation is a most important and intimate one. Through the admirable works of Mr. Darwin we are all more or less familiar with the important part that insects play in cross-fertilization of plants, and thus in promoting a vigorous and healthy growth. They are also of importance to vegetation by preparing and distributing fertilizing material by hastening on decay. You have probably all noticed how soon a dead tree will become riddled through and through with the galleries of insects or their larvæ, and the loosened bark falling to the ground, soon all will crumble down to dust under the industrious bands of the small workers; and in a few years will the giant of the forest be distributed to serve for a new and more vigorous growth, which may now occupy the very same spot that would else be filled with only the useless and unsightly remains probably for a century or more in the slow decay in air unaided by insects. But while thus a large class of insects are occupied in promoting a healthy vegetation by aiding cross-fertilization or by hastening on decay of dead matter and distributing the same as fertilizers, others and a most important class is occupied in checking a too rapid growth or increase of vegetation. At first sight this would appear to be a paradox, and only to prove that insects are useless and a plague to man. But if we have been lead to understand the balance of nature as a law, and one that is as beautiful as it is comprehensive, we will know that the one class is as important and necessary for the welfare of man as the other. There is a tendency of living objects to increase enormously and to occupy space to the exclusion of all others. Thus if a single species of plant would be allowed to increase without reserve it would soon come to fill all available space to the exclusion of all other plants of similar habit. An example of this law is furnished to every one of you in the tendency of weeds to overrun your grounds, which as native species are much hardier than those we cultivate, which can only thrive under the fostering care of man. To keep this tendency within proper bounds nature has provided more than one remedy, but one of the most important ones is undoubtedly insects. Each species of plant has therefore got its corresponding species of insects that are ever ready to keep it within proper bounds.

It has been calculated that on an average there are at least five species of insects that prove to be more or less injurious to each species of plant. The actual number will probably be somewhat larger, as the number of newly discovered insects has increased unexpectedly during the latter half of the present century. As soon as a plant therefore will increase under some favorable circumstances so as to exceed the proper bounds, these insects that prey upon it will also be favored by such an increase of food-plants, and will soon appear in a proportionately large number and check this undue increase of the plant.

While thus a large class of insects are occupied as scavengers on land and in water, and a still greater number to produce a healthy and luxuriant growth of vegetation, or to check an undue increase; not a small class are occupied in keeping the increase of these insects themselves within proper bounds, by preying upon them. A large class are directly carnivorous, the tigers and lions among insects, by preying upon every insect that comes in their way; another and more important class to man are parasites on other insects, their larvæ or eggs which they destroy. Thus the balance of nature is ever kept up, and this law is most beautifully exemplified in the case of insects.

GOOD AND BAD INSECTS.

Insects are moreover of importance as an article of commerce. Not only does the honey bee supply us with a delicious and healthy food, the cochineal insect with a magnificent coloring matter, but many other important products come directly or indirectly from insects, as shalac and silk the value of which amounts to millions annually. Insects come in more or less relation to man in almost every branch of industry with which we are acquainted.

That relation in which they attract the greatest attention is undoubtedly as injurious to our crops, and as this involves a loss of millions upon millions annually to our country, and to the individual often the greater part of his profit for the year, if not more, it is a question well worth our attention. This is applied entomology, and if time would allow it would be a profitable thing to stop just here and try to make it clear to all of us in what this relation consists, and to what extent the evil might be reduced. This is an evil, if we so must call it, which can never be altogether done away with, and which would not even be desirable under the present condition of things; but it can be reduced to a minimum, and this applied to a single crop of our State—the wheat crop—would make a difference of several millions annually in our favor.

These are a few of the subjects that present themselves to the student of entomology without going into details or into the realm of pure science. Entomology as a distinct subject of study, as a science, is what I will especially call your attention to this evening.

SCIENCE OF ENTOMOLOGY.

Not many centuries ago it was considered to be below the dignity of man to occupy himself with such trifling things as insects, and if anyone in spite of this dared to pursue the study his soundness of mind was liable to be questioned. Since that time we have learned to become a little more liberal. The general opinion is no longer openly against the subject, and we are all willing to concede its importance. But this is as far as we have advanced, and back of this there is yet a general indifference. It is still in the hands of a few.

But the work is ever advancing, and the time is dawning when this study will no longer be in the hands of a few, but the property of the people; and when we will have not only learned to know and concede the importance of the subject, but will have learned to feel its importance and give it that aid and sympathy which it requires to reach its full growth. Then, and only then, can we receive the full benefit that is to be derived from it as a science.

How is this indifference to be removed, and how are our people to be made to feel the importance of the subject? To this I would say there is but one sure and proper way, and that is to educate our people up to it. This is the way in which we have acquired all the knowledge that we do possess, and must acquire what still remains to be added.

The sciences take their birth, no man knows where, somewhere in the depth of the human soul. Their growth is commonly slow, they develop in the hands of the few, and often in the most humble and insignificant habitations. For years man is ignorant even of their existence, but as time rolls on the time will come when they can no longer be concealed, and we begin to comprehend that a new star has made its appearance on the firmament of human knowledge. Its lights may at first be faint and indistinct, but as it comes nearer it grows brighter, and as it is the pride of our nation to add another star to its banner on the admission of a new state, so will also this star be put down on the chart and admitted into the temples of human knowledge, from where it will cast its light over the people of the land.

Now entomology is such a science. It is commonly not recognized

as such at our universities and colleges, but is treated only as a small part of general zoology. There are very few of our institutes where entomology has yet been recognized as a distinct subject of study, or where even the first principles of the subject are taught. I am confident that I do not claim too much when I say that entomology is a subject as distinct as any other of the natural sciences. It has a light of its own. It is a field that will never be recognized nor properly cultivated as long as it is only a part of general zoology. Let, therefore, our higher institutes of learning first recognize entomology as a distinct subject of study. It is their privilege and duty to do so. Let it receive its place along side with the other natural sciences, and its care put in the hands of a proper and qualified person. The time will then soon come when it will no longer be in the hands of a few, but as it will gradually widen out under the fostering care of such institutes, it will soon come to include not only our colleges and academies, but in due time also our common schools. When thus the first principles of entomology will be taught in our schools and as much attention given to this as to kindred subjects, will this great indifference under which we now labor gradually die out, and our people will have learned not only to know but to feel the importance of entomology.

This has been the case with botany. As a science it has developed far in advance of entomology, and has now for years been recognized at all our institutes of learning, and been in the hands of qualified persons. The interest for the study has continually been on the increase, until at present it includes not only our colleges, but also a good part of our common school system, and we have such a delightful book as Gray's first lessons in botany to put in the hands of the children, which has already begun to be loved so much by the children of our country. What the benefit of this study has been and will be to our people it is not for me here to state. It will be enough to say that entomology will not stand back of botany in this respect.

ENTOMOLOGY AND HORTICULTURE.

If I do not misjudge, I think that you as a horticultural society are under somewhat the same condition of things. What is the greatest difficulty that you have had to contend with as such a society to reach the high aim you have before you, and for which you have worked with so much success and energy? Is it not that the general opinion has been against you, and that there is yet too much of indifference among our people on the subject?

We are aware that not many years ago the general opinion was that no fruit at all could be grown with success in Minnesota, and he who dared to differ from this was laughed at and considered to be very short-sighted. Since that time your Society has come to the front, and it has been proven repeatedly that fruit can be grown, and that with profit in our State. But still the general feeling is too much of indifference on the subject, and the industry remains in the hands of a few. It is not until you have removed this indifference and our people have been educated up to recognize and to feel the importance of horticulture that we will derive the full benefit that is to be derived from it.

I might put before you some of the benefits that are to be derived from the study of entomology, as they are many, practical and important. But I shall stop right here and only ask that you will continue to recognize entomology as an important subject for your Society, and give it that attention and sympathy that it at present needs. The time should soon come when entomology will be recognized not only at our State University, and especially at our College of Agriculture, but also by all the other colleges and schools of the State. There is also room for the State, as such, to recognize the practical importance of entomology, by the appointment of a State entomologist as many of the states have already done, besides the work which is now being done by the geological and natural history survey of the State, which is distinct.

Entomology has been slow to develop, but at last it has come to the front and stands before us to-day as a science that stands back of none of its associates in extent, in completeness, in beauty, in importance, and in the benefits that are to be derived from its study by man in almost every department of life.

Mr. Harris, from the Committee on Entomology, presented the following:

REPORT OF COMMITTEE ON ENTOMOLOGY.

Mr. President and Gentlemen of the Minnesota State Horticultural Society:

You cannot reasonably expect a very elaborate report from me, because I am not a scientist or even greatly learned in the science of entomology. But like yourselves I have been frequently victimized by

injurious insect pests and have observed them enough so that I can distinguish some of them when I see them.

My observations have been mostly confined to Southeastern Minnesota. I am very glad to be able to report that within the limits of my observation but very little injury was done our fruit by the larvæ of the codling moth. Our apples were fair and very free from worms. I think this a hopeful sign that some parasite has appeared to prey upon the insect, or that some new bird may have adopted the pupa chrysalides or the perfect insect as an article of food. This condition of things was very unexpected, as usually in years of short crop they generally utilize the whole of it for the purpose of propagating their species.

I have also noticed that upon my place the curculio or apple gouger were not nearly as great as in the three or four years preceding. That might be owing to the presence of greater numbers of birds than usual early in the season, or to the fact that my wife has for two or three years indulged in the expensive luxury of raising turkeys.

Neither have I observed the tent caterpillar to be as numerous as during the preceding year, when almost every variety of tree and shrub was badly infested with it, and young forest trees seriously damaged from being defoliated by it.

The grapevine flea beetle was not nearly as injurious as common. Early in May, or about the time our apple trees were in blossom, I noticed what I suppose to be the leaf-roller or leaf crumpler in great abundance, both upon the bearing and upon the small trees. These caterpillars were of a pale greenish color and at first appeared to curl up and fasten together the small leaves as soon as formed and feed within them; and in this way they appeared to do considerable damage to the smaller trees and root grafts. They did not appear to last more than three or four weeks, but in that time they kept the trees nearly defoliated and in a bad condition to make a strong growth during the dry season that followed. I could not discover that birds molested them, as they were just as numerous upon trees where they had built their nests. At the time, I had not leisure for studying them up or trying any experiments as remedies. At about the same time, or a few days later, the canker worm made its appearance in much greater numbers than we have ever before known them. These could be easily distinguished from the others, as at first they eat small, round holes through the leaves, and towards the last eat nearly all the pulpy portions of the leaves away. They were what we usually term a span worm or looper, and, when full grown, where about an inch long, of a

blackish or brown color on the back, with a yellowish stripe on each side. They not only infested the apple trees, but also the plum and some kinds of shrubbery. Scarcely any of the maybeetle — the larvæ of which is the white grub, so injurious to the strawberry beds and grass plats — were seen flying this year; but the two-year old larvæ, that is now in the ground, were rather more destructive than the average of seasons.

I found an insect of Plantbury family upon the young twigs of the plum; they were apparently feeding upon the juices of the twigs, and wherever one was found the leaves and end of the twig above had turned black and appeared as if blighted. I have sometimes seen a nearly allied specie upon the blighting twigs of the apple.

Aphides, or plant lice, were very plentiful and in many cases injurious. I had a half acre of Lima beans that were nearly ruined by them. They were so numerous that no fruit set, or did the plants make any perceptible growth for about three weeks. The points of the vines and the blossoms were thickly covered with them. I purchased a pound of Dalmation powder and gun, and commenced applying it as an experiment. I soon noticed a variety of the lady bug upon every plant, so after going over about forty hills I concluded that to save the beans at the risk of destroying the lives of so many friendly insects might prove to be an unfortunate speculation. The result proved to be a war of races in which the bug came out ahead. In a short time the aphides disappeared and the bean commenced thriving, although so late that they did not mature their fruit.

Before closing this report I wish to allude to two insects that are doing an immense amount of damage out in our prairie counties, the cottonwood tree beetle and the willow worm. These insects are increasing so rapidly and committing such depredations that it is only a matter of a very short time before these valuable pioneer trees can no longer be grown unless some remedy is found for them. I would suggest that our agricultural department of the State University enter upon an investigation of these destructive pests, and try and aid our prairie farmers to head them off. This is a line of work that calls for immediate attention.

DISCUSSION.

Mr. Gibbs. Knowing as I do that what is said at these meetings is for the benefit of the large number of people that read the reports, and as I am glad to see the annual increase in the number of such

readers, and considering the vast importance of this subject of entomology, in the interest of agriculture and horticulture, it seems to me Mr. President, we can afford to take a little time to place some additional matters upon the record.

And first, in answer to the question of Prof. Oestlund of how to excite a deeper and wider interest in this State on the subject of entomology, that it may be recognized as proper to be made a study in our public schools. The first answer I would make is this, let the specialists in this science carry on their studies, hand in hand with other investigations. As they proceed in the study of insects let them give the public information as to those that are friends to the farmer and horticulturist as well as to his enemies, the means for the destruction of injurious insects, giving warning of approaching foes when discovered.

I have no doubt in my own mind that entomologists could have greatly lessened the ravages of the chintz bug; but what chance was there for them to do it? They could get no audience in the State if they spoke upon the subject; farmers did not realize its importance or pay any attention to it. But why cannot entomology, ornithology and forestry be considered together with reference to these subjects? Let them do all they can to educate the people to the value and usefulness of birds, and warn farmers of the ruinous practice that prevails of encouraging the shotgun all over these prairies, thus destroying the few friends of man that are placed here to keep these insect enemies in check.

A simple illustration will make the matter clear to any reader. In my own neighborhood in Ramsey county, Dakota, there is a very nice man, a friend of mine, who has a family of boys nearly all grown to manhood, and from the father down everyone of them has a shotgun, and their house is full of ducks; and every moment of leisure time they get they are out over those prairies shooting everything that wears feathers. [Laughter.] I don't believe a plover would dare to venture within two miles of that house; and that farmer was the one to complain most of the damage done by insects.

It is admitted I believe there are some four hundred millions of dollars worth of property destroyed annually in the United States by insects. At the same time I do not believe there is a single destructive insect whose ravages could not be prevented or at least greatly lessened by a simple observance of the laws of nature in regard to them.

Insects are rapidly increasing in numbers. We must look to these professors of entomology, to these scholars who are familiar with or-

nithology and to these experts in forestry for instruction in these matters, to lead on bravely in the work of education in these matters Agriculture will soon become impossible unless the importance of entomology is recognized and the people are educated upon these matters. As said by the professor the knowledge of this subject is not carried beyond the few specialists who now take it in charge.

I believe the terrible devastation of crops in Minnesota from chintz bugs has been due simply to the encouragement of the shotgun on the prairies. I have sometimes wished I had the power of the emperor of Russia, that I could banish every shotgun in the land.

Mr. Pearce. Mr. President, I agree with friend Gibbs. I will go still further; I believe our legislature are enacting laws that are working destruction to the State in permitting the killing of our prairie chickens. If they were suffered to live, I doubt if we would have suffered seriously from the chintz bugs.

There is a bounty on the pocket gopher, one of the best friends we have. If I had ten thousand on my place, I wouldn't kill them. [Laughter.] You may say they eat grain. Very little; they eat bugs and all kinds of insects. I have worked among striped gophers where there were thousands of them. A little corn sprinkled around the field will prevent their taking up the growing crop. I have seen them fight over the pile of corn placed out for them to eat. With a peck of wheat you can protect twenty acres of corn. Protect these little animals; encourage them; they are the best friends we have. I never kill one of them, not even a skunk. If we would stop killing these little animals, we would hear less talk of the destruction of our crops.

Mr. Harris. I am glad Mr. Pearce corrected himself by saying he was a friend to the striped gopher, although the pocket gopher was put here for a purpose and has given us a soil that beats the world. I have been condemned for considering the pocket gopher more beneficial than injurious, but I still think there is no animal more useful, unless it is the common skunk. It is useful in destroying the larvæ of the maybeetle. I think so much of it, I have two specimens mounted and placed where I can see them.

There is one bird I think a good deal of, known as the crossbeak. It is really fascinating to sit down and watch it bring the beetles to its nest to feed its young. Last summer I was afraid I would lose my patch of potatoes, but I soon noticed the birds were taking the bugs, and I only lost a few hills in the whole patch. I have not used Paris green for fear of destroying as many of our friends as of our foes. I believe if we understood entomology more thoroughly it would be of

great advantage. I discovered two or three years ago, when our apple trees were infested with aphids, that the lady bugs destroyed them and protected the trees. There is nothing more interesting to children than "bugology" when they once get started in it, and I hope the rising generation will be taught in the science.

Mr. Wilcox. I would like to inquire if the curculio ever prevails on wild plums?

Mr. Harris. I have seen them, but if the plums are thrifty the sap seems to drown a large portion of them and the plum comes to maturity.

Mr. Wilcox. I notice a good deal of apprehension exists among farmers with regard to chintz bugs. I do not apprehend much injury will result from their ravages another season. They are not apt to develop except in dry seasons, and it is stated that three dry seasons in succession is very rare.

Mr. Harris. Chintz bugs are found in large numbers where rubbish is allowed to accumulate; they deposit their eggs, and if the season is dry they are ready to continue their work. If our birds were spared, we would not have so much loss from insects.

Mr. Gibbs. I referred a while ago to the necessity of forestry. I do not think there is an instance known where grasshoppers have crossed over any large body of timber in their migrations. If the government had retained these lands in their own hands till they were reforested, that work could have been accomplished at less expense than the amount of damage done by grasshoppers in their invasions.

President Elliot. I think you are in error in that. We had large quantities of them that came over the timber; they were here but two or three times, but the air was full of them.

Mr. Gibbs. They did not get far from the timber, did they?

President Elliot. They extended over a good deal of territory.

Mr. Gibbs. Prof. Riley in his investigations arrived at the conclusion that grasshoppers were limited in their travels east by the condition of the air. He indicated boundaries beyond which they would not be likely to pass, and the grasshoppers disappeared substantially on the line that he indicated. It may be stated that a large body of timber so affects the moisture of the air that it appears to be quite an effectual barrier to their extension.

Mr. Gould thought timber had a marked effect in preventing raids of grasshoppers. They did very little damage, except in few instances, this side of the timber known as the Big Woods. He was here at the time of their visitation in 1857; they came in August of that year, de-

posited their eggs and reappeared the following season. They did little damage and soon disappeared. At the time of their last visitation they remained a period of five or six years and caused an almost total destruction of crops. In Kandiyohi county, where crops were almost totally destroyed, there was little timber, while in this vicinity there was very little loss. This indicated that timber proved an effectual barrier to their eastward march.

The last on the program for the evening was a paper by Prof. Pendergast.

EXPERIENCE IN ORCHARDING IN MINNESOTA.

By Prof. W. W. Pendergast, Hutchinson.

In the spring of 1856 I had one hundred two-year old apple trees of the standard sorts,—Greenings, Northern Spys, Baldwins, etc.,—sent me from Dimond's nursery in Stratham, N. H. They were planted in a poplar clearing in front of my house in Hutchinson. On account of lack of suitable ground they were set only two feet apart. Nearly all lived and made a satisfactory growth the first season. The winter following was one of the most severe ever known in Minnesota, but the snow was deep and that protected and saved the lower half of the trees. Every twig that projected above the snow line was killed, and some were dead to the ground. In the spring the dead wood was all cut away and the trees were left to grow as nature willed. The next winter there was not much snow, but the trees had grown bushy causing a small drift around them, and the result was about the same as the year before. Some of them lived along at this "poor dying rate" till the Sioux Indians in 1862 burned the house, and the whole place went back to primeval desolation. Thus ended my first and only attempt at fruit raising in the Territory of Minnesota.

In 1866, having satisfied myself that Transcendents and Hyslops had certainly been grown in this State, I bought one hundred yearlings and one dozen three-year olds of each kind, together with a few Duchess and Siberian crabs of an agent from Anoka by the name of VanValkenberg. With the exception of the Duchess all thrived well. In three years the larger ones commenced bearing, the Transcendents and crabs yielding astonishing crops till 1878, when the Hyslops and Red Siberians began to die. From the first they had not shown as much vigor as the Transcendents, which up to this time appeared to be iron-clad. It was not long, however, before they too

showed signs of discouragement, and an inclination to give up the struggle for existence. Each returning spring showed fewer living trees, and those in worse condition. There are now perhaps a dozen of them "cumbering the ground," but their days of usefulness are past. They blossom well but the apples are like angel's visits. A word about the Yellow Siberian. They have always been at home, have made a vigorous growth every year and are now between thirty and forty feet in height with trunk two and one-half feet in circumference. These trees were set in a rich black loam ten to twelve inches deep, underlaid with coarse gravel, and then sand to an unknown depth.

For the first few years my orchard promised so well that I was tempted to venture too far. In 1873 I exchanged eighty acres of land in Sherburne county with Shearman, a nursery man of Rockford, Ill., for apple trees. This gave me 32,000 root grafts and 1,000 two-year-olds of most of the kinds recommended for trial by the Minnesota Horticultural Society. Nearly all of these I planted myself, nursing and caring for them till most of them died a natural death. The kinds were Transcendent, Hyslop, Duchess, Red and White Astrachan, Tetofsky, Fameuse and others. Of these probably 500 Transcendents and half a dozen Hyslops are alive to-day, most of the Transcendents in fair condition. Three or four Duchess trees, planted on the north side of the house and within three feet of it, look bright and sound from the ground to the topmost branches, but they do not bear a peck of apples a year. Probably they are in too cool and shady a place. So it seems that the conditions essential to healthy growth are decidedly unfavorable to fruit-bearing.

Out of several hundred seedlings which I have raised, all are now dead but three. These are about fifteen years old and apparently as hardy as the Siberians. Transcendents, Hyslops, Early Strawberries, Orions, Hebrons, and all the so-called iron-clads have been winter-killed around them, but these are all as sound as oaks. One is a seedling of the Duchess and the other two sprung from the original stock when the root grafts died. Hardiness however is their only good quality. The fruit, though considerably larger than the Siberian, is scarcely better than that of the Hyslop, and that is placing it low enough. The fact that by years of experimenting we can make some improvement in quality and still retain the absolute *hardiness* of the crab is encouraging. Others have done very much better than I have, and the end is not yet. Every year will add its quota, and in the "good time coming" some one will give us an apple as good as the Wealthy and as hardy as the Yellow Siberian.

SMALL FRUITS.

Red Dutch currants are a success wherever I have set them, and yield bountifully whenever the season is not too dry. Other kinds have not proved so satisfactory, though the fruit is larger.

Gooseberries—American Cluster and Houghton's seedling yield enormously about two seasons out of three. The currant worms trouble them however much more than they do currants.

Raspberries and strawberries demand a moister soil than they find in my garden. Outside of the level tract with the gravel subsoil above described, with a little winter protection, they give fairly satisfactory results.

Grapes have proved a failure on the gravelly land, but do well in the woods and on the south side of lakes. I have about two hundred vines on my farm where the subsoil is clay. These are just beginning to bear and the promise for the future is most flattering.

On motion the meeting adjourned till Friday morning.

MORNING SESSION.

FOURTH DAY, FRIDAY, JAN. 20, 1888.

The meeting was called to order at 9 o'clock by President Elliot.

PRIZE ESSAYS.

Mr. Pearce, from the Committee on Prize Essays on Grape Growing in Minnesota, presented the following:

Your committee on the best essay on Grape Growing report that there is one essay competing for the prize, by R. A. Latham, of Excelsior, aged nineteen years, and who is entitled to the prize.

M. PEARCE, E. H. S. DARTT, J. M. UNDERWOOD.	}	Committee.
---	---	------------

GRAPE GROWING IN MINNESOTA.

By R. A. Latham, Excelsior, Minn.

LOCATION.

In the selection of a location for a vineyard a place should be chosen in a neighborhood where vine growing is already known to be a success. The place selected should be if possible a south or east

slope. High ground on the south shore of a lake or on the banks of a river, to prevent the late frosts of spring and the early frosts of fall, is preferable. Almost any slope will answer though to plant vines on if it is well sheltered. If there is not a natural shelter near the place selected one should be provided.

SOIL.

Any soil that will raise good corn or potatoes will do for a vineyard, but preference should be given to that which is not too sandy and is underlaid with yellow clay containing fine lime stones in abundance. In such a soil vines will be healthier and less liable to winter-kill.

LAYING OUT.

In laying out the ground the rows should be about eight feet apart running horizontally around the slope so as to prevent the hill from washing. For convenience sake it is better to leave alleys 11 feet wide running up and down the hill about every 150 or 200 feet apart, making it easier to tend the grapes, as will be explained farther on. The vines should be planted from six to eight feet apart in the rows, depending upon the strength of the variety.

VARIETIES.

The varieties that are planted in the largest amount are the Delaware and Concord; but Moore's Early, which is a large dark purple grape, and ripens early, and the Pocklington, a large white grape with a very fine flavor, and a number of other varieties are growing in favor.

PLANTING.

In planting, the holes should be dug slanting and from ten to twelve inches in depth and the width of a spade. It is best not to dig very many holes in advance of the planting as they will dry out. The earth in the holes should be well pulverized.

While planting is going on the vines should be kept where they will not dry out. Young vines one or two years old that have been raised from cuttings in a nursery should be used in planting a vineyard.

The roots should be trimmed back before planting so that when they are put in the holes they may have their natural position, and it would be better if the hole is deep enough and slants sufficiently to

bury a part of the top also. Good rich dirt should be put next the roots and pressed firmly around them with the foot. The vines should all slant in the same direction so they can all be trained on the trellis in the same way. The accompanying cut (Fig. 1) shows the shape of the hole and the vine therein ready for covering with soil.

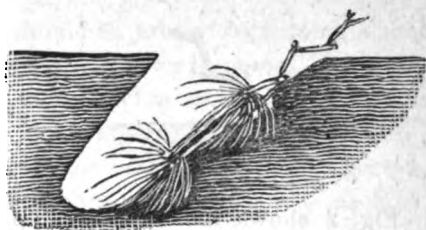


FIG. 1.

FIRST YEAR.

There is not much to be done the first year except cultivate and keep the weeds out of the vineyard. A crop of some kind can be planted among the vines, such as corn or potatoes that can be cultivated. In the fall select the best cane and prune it back to about six inches in length, and cut all other growth away entirely. This cane should then be bent down and covered with dirt three or four inches deep and then with straw two or three inches. Finally plow three or four inches deep throwing the furrow toward the vines. No fruit should be allowed on the vines this year.

SECOND YEAR.

The vines should be uncovered about the first of May; but if the weather is warm before that time, they should be examined, and if the buds show signs of starting, they should be taken up at once. After the vines are taken up the earth should be removed three or four inches deep from around the base of the vine, and all the roots that are near the surface should be cut away.

This root pruning should be repeated every other year. The ground should be plowed again, throwing the dirt away from the vines. After this stakes six feet long should be set at each vine to train the young shoot to. All the new shoots should be pinched off except the strongest, and that should be allowed to grow till late in July, when it should be stopped by pinching off the end.

The laterals (that is, the shoot that grows from the base of each leaf) should be pinched off, leaving only one leaf; and when another lateral grows from the base of this leaf, it should be pinched off in the same way; and so on throughout the growing season.



FIG. 2.



FIG. 3.

Fig. 2 shows the process of pinching or trimming the laterals. Unless extra nice bunches are wanted, the second pinching will generally be sufficient. The ground should be cultivated thoroughly during the summer. In the fall the vines should be pruned back, leaving about two-thirds of its length, and prune off all the laterals. A bunch or two of fruit may be ripened this year without harm.

THIRD YEAR.

In the spring of the third year the vineyard should be trellised. This can be done best before the vines are uncovered. The posts should be seven feet long, so that when they are set in the ground they will be five feet above and two feet under ground. They should be driven in twelve or sixteen feet apart. Four wires are required for a first-class trellis. The lowest wire should be placed eighteen inches from the ground and the others fourteen inches apart. The size of wire to use is No. 12 galvanized. The wire should be fastened to the posts with staples, leaving room for it to play, so that it can be tightened in the spring. After the trellis is finished the vines may be taken up and tied to the lower wire, all being trained in the same direction. The string used by many for this purpose is bag twine; it comes in packages of about ten pounds. Care should be taken not to tie the vines so tightly to the wire as to stop the free circulation of the sap and thus impair the growth. The vineyard should then be plowed, throwing the dirt from the vines, and spaded under the wires three or four inches deep with a pronged spade. When the shoots have grown from four to six inches, so that the difference in their vigor of growth can be seen, then thin them out, saving the strongest and not allowing them to grow nearer together than six to ten inches. As a rule, two shoots should not be allowed to grow from the same bud. When they have grown long enough to reach, they should be tied to the next wire. The laterals growing from the new shoots should be pinched off the same as the direction for the previous year. When the new shoots have grown to the top wire, they should be pinched off at the extremity.

The vineyard should be cultivated and hoed frequently throughout

the summer. In the fall the vines should be pruned by cutting these new shoots off an inch above the second bud from the base. This will leave spurs of two buds from six to ten inches apart. As the vine does not yet cover the entire space on the trellis, it should be extended to do so another year, and a strong shoot should be selected growing near the end of the vine and pruned long enough to reach to the next vine.

In covering the vine this season a little dirt should be taken from under the base of the vine on the side towards which it is to be bent down and a little ditch made about two inches deep the full length of the vine in which it can be laid. It should then be covered and plowed the same as before. Considerable labor can be saved in covering by putting earth enough on the vines with a spade to hold them down, and then throwing a furrow with a large plow, having a long mouldboard, upon the row from each side, being careful not to go deep enough to cut the roots.

Plowing spring and fall as directed with a light plow prevents the accumulation of roots near the surface, which is in many ways a great benefit to the vines. Fig. 3 shows the vine after it has been pruned at the end of the third year. The vine may ripen three or four pounds of fruit this year, but beware of overloading.

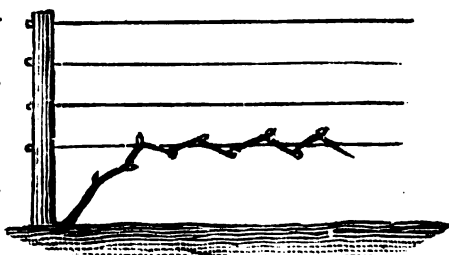


FIG. 4.

FOURTH YEAR.

Before the vines are taken out this year the trellis should be examined, and the wires tightened. The vines should be tied the same as the year before, extending the vine to fill the trellis to the next vine, by tying to the lower wire the cane pruned the fall before for that purpose. In thinning this year two shoots should be left on each spur, selecting the strongest. All the rest should be broken off, and the new cane that was left to extend the vine should be thinned the same as per directions for the year before. When long enough the new shoots should be tied to the wire, and the laterals pinched off, and this should be continued throughout the growing season. The vines should not be neglected till they have grown long, but should be tied up and the laterals pinched as soon as they have grown enough to do so, as it is injurious to the vine to take off a large amount of foliage

at one time. When the shoots have reached the top wire they should be pinched off; the stems of green grass are used to tie the shoots; about five strands to one tie. In pruning this year spurs of two buds each should be left the whole length of the vine at a distance of six or ten inches apart. In selecting spurs on the part of the vine where spurs were left last year, a shoot should be selected growing as near the main vine as possible and two buds left on it, and the old spur should be cut just above the new one. Fig. 4 represents the pruning of the spur this year. Cover the same as before explained. This year the vines may safely carry eight to ten pounds of fruit, and after this, as a mature vine, it should bear ten to fifteen pounds yearly; but look carefully to the thinning of the fruit in the early part of the season, to prevent crippling the vine by overbearing.

The after-training of the vines is substantially the same as given for the fourth year.

RENEWING.

In renewing the vine on account of a vacant place on it caused by the lack of shoots to make spurs, a strong shoot should be selected, to be tied to the lower wire in place of the old vine, and the old vine should be cut off just beyond the selected shoot. Spurs should be grown on this cane as directed for the third year.

GATHERING FRUIT.

When enough fruit has been ripened, the vineyard should be gone over and the ripe fruit gathered. Fruit should never be gathered that is not thoroughly ripe, as a grape raised in Minnesota that is not wholly ripe is sour and not fit to eat or market; so, in order to please the buyer and to obtain a ready sale and a good price, do not pick anything but ripe grapes. In picking grapes, care should be taken to handle the bunch as little as possible, as it will rub the bloom off the grape and injure the looks of it. The best basket to pick the grape in is the ten pound air-tight basket with a light cover. After the baskets have been filled, they may be brought to the alleys, covered and loaded. This is one use of the alley; the other is to facilitate the handling of straw in the fall.

COVERING OF MATURE VINES.

The vineyard should be covered with earth every fall, as before directed; but in heavy clay soils, after the vines become mature (about

the fifth or sixth year after planting), the covering of straw may be safely omitted. At this time the roots have acquired sufficient size and maturity, and have penetrated far enough into the ground to be able to withstand the cold; and the roots near the surface that would have killed have been kept down by the plow. In a lighter soil a greater amount of protection is required.

Mr. Pearce from the committee on Prize Essays on Orchardring in Minnesota presented the following:

Your committee on the best essay on Orchardring in Minnesota report that there were three essays submitted. One by Norton F. Brand of Faribault, aged 18 years; one by Edgar D. Sias of Minneapolis, aged 18 years; one by Edwin Deacon of Rochester, aged 26 years. As the latter was not within the requirements of the Society as to age there were but the first two considered, and the committee award the prize to Norton F. Brand.

M. PEARCE,
J. M. UNDERWOOD, } Committee.
E. H. S. DARTT.

ORCHARDING IN MINNESOTA.

By Norton F. Brand, Faribault.

Mr. President and Gentlemen of the State Horticultural Society:

Being freed from school by our recent vacation of two weeks, and seeing your offer for a prize essay on Orchardring, I thought it a good chance to make my vacation pay. I am an inhabitant of Rice county, outside of the most favorable localities for fruit growing. Ours is the third district for apple growing so far as natural advantages are concerned. I cannot boast of age, but have had some chances to learn, having been brought up in a nursery and orchard, and have had the benefit of experience for the most of my life, which began eighteen years past. I also have had many advantages in getting information from periodicals. We now take of papers that treat of the subject whereof I write, *The Farmer, Farm, Stock and Home, Western Rural, Prairie Farmer, New York Tribune*, and frequently obtain others. I am now glancing through a year of the *Country Gentleman*, in which I find some good items to sustain my strong points. We also have the

Horticultural Reports from the beginning of the Society, and some from other states of the Northwest.

To begin with, to make orcharding pay, take as many good papers as you can afford to, and keep informed on your business. Don't leave out your State's papers on this subject. To get an orchard up to bearing size in such a way as to profit by it after it begins to bear, is the greater part of the work, so the most of this paper will be devoted to that branch of the subject.

LOCATION.

First. Select your site. Anything is better than sand. The best soil, however, for our hardy apple trees, is a deep loam or porous clay subsoil, a subsoil composed of yellow, red or blue clay, mixed with either large or small limestone is one of the best. But as you already have your land on which you are to plant and cannot escape using such as you have, you can perhaps better its condition. If the subsoil be sandy or gravelly, dig a hole one foot deep and three to six across, for each tree, and fill with rich loam and clay marl. If old boots, shoes or bones be handy, cast them into the hole. Bones contain much lime, either phosphate or carbonate, and both are important to plant life and growth. Lime is a large constituent of the bark of apple trees. If your subsoil be a cold, retentive blue clay, that will hold water and not more than three feet beneath the surface, you must plow it in such manner as to get about four feet of good soil above the clay, with a drain four to five feet below the surface. This drain may be constructed by plowing from the place where the drain is wanted, two or three times, then sink your plow down in the dead furrow as deep as possible for two or three bouts. Shovel out the earth loosened in the bottom of the dead furrow, then dig a trench one spade wide. You will now find yourself from four to five feet below your land surface; fill the trench with broken stone and gravel. These drains should be twenty-five feet apart. If preferred, tile can be used instead. Remember this, however. So prepare the ground that the tree will get four feet at least of good, friable soil, above the underlying clay. Now sow broadcast manure, lime and ashes. The drains should have descent sufficient to prevent standing water. Now plow towards the drain three or four times, making a ridge over it on which the trees are to be planted. I have now described what I hold the best preparation of ground for our two poorest fruit-tree soils.

Next if your soil be a dry, clay ridge, or a timbered ridge, make a large hole and fill as for sandy land. If a good loam soil on porous

clay subsoil, deep plowing and harrowing will be all the preparation required. If the surface soil be sandy, on clay subsoil, prepare as for gravelly subsoil; and in after cultivation add fertile loam with manures to the surface.

Don't be afraid of wet soil, if it be underlaid with a porous, limestone clay subsoil. Some of our best Duchess are where we can get water within four or five feet, and they bear our largest and best colored apples. The extreme dryness of our climate requires that the tree get a very large amount of its moisture from the soil.

Prof. Budd says that in some of the dry localities of Russia fruit growers water their orchard by a system of irrigation. This last Autumn my father visited the oldest orchard in the Northwest, that at St. Joseph, Mich. He tells me that the trees are 109 years old, and are still producing good crops. About all left of this orchard is the lower row of trees—near the water, and only four or five feet above the St. Joe river at low water mark. They have been submerged at times to a depth of eight feet.

Again, in our neighborhood, in 1884-5, Duchess on sandy clay, and gravelly subsoil were nearly all killed. But none were killed or even seriously injured on moist clay subsoils.

To further sustain my position I will introduce to you some of the experienced writers of the *Country Gentleman*. One who signs himself D. S. B., from Washington county, New York, says: "I am led to believe that the cause of the death of many trees is too little moisture in the soil during the severe winters. Lands long cultivated in the usual manner become incapacitated for retaining moisture as they formerly did, and in some way this affects the tree in cold weather. * * * Even in our wood lands after a dry autumn and severe winter many trees die wholly or in part, the following spring and summer. Fifty years ago our best orchards were on our dryest hills; now they are on our cooler moist loams and slate hollows, and yet we see seedling trees growing and bearing abundantly in the fence corners, and depressions on dry hills where snow drifts accumulate in winter, and where the soil is always more moist. * * * One orchard of two hundred trees set eighty years ago on broken land—are all dead, but those on the lowest, moistest soil, and these bear in spite of a half century of neglect."

B. F. Johnson, Champaign, Ill., says: "Try the experiment of giving a few fruit trees the benefit of a thorough wetting of the roots before the winter sets in. The advantages are: a soil saturated with water does not freeze so hard, or the frost injure the roots of trees as

much, as a soil that is dry." Mr. Johnson mentions experiments that he has made, watering trees Autumn and Spring with wonderful results, and adds: "Few persons recognize the fact that the roots of the pear and apple love water (but not standing water) almost as much and as well as the orange." He mentions pear trees in Colorado large and healthy in earth so saturated with water as to kill the grass. Speaking of the enormous crops of apples on Duchess and Wealthy in Colorado, he adds: "The essential element of success here was water — an abundance of water — and wet feet from April to October." In another article on an orchard in his own county, he says: "Of an orchard planted between fifty and sixty years ago I observed three or four apple trees remarkable for their size and vigor and laden with fair, smooth and (for their quantity) large-sized fruit. Curiosity being excited, a closer inspection was made and it was found that each one of these trees had one or more hog-wallows under it. The site of the orchard was originally moist, if not wet, and close to the creek's bank. If the largest and most valuable of our timber trees grow best in a soil wet six months of the year, and moist twelve, why not the apple?"

In further support of my position I refer you to a report in your last volume of transactions, in which mention is made of an orchard of three hundred trees in Northeastern Iowa, set in 1865, and described as follows: "Many of the trees are from ten to fifteen inches in diameter and twenty to thirty feet in height. * * * The soil a rich black muck and so saturated with moisture that the lower edge of the orchard is a springy bog."

In the *Gardeners Monthly* of 1884 I read: "It is well known that trees endure a much lower temperature in moist atmospheres than in dry ones."

Our esteemed friend Mr. Harris has always advised rich, moist land for an orchard site. Facts are what count. I have given the facts.

The old Wolf River is growing where its roots were in water at certain seasons. An old seedling mentioned by E. Wilcox, of Trempealeau, which once bore twenty bushels in a year, stands on low ground, near a marsh.

If you have no water near your orchard site, and have slopes or hill-sides, if the soil be all alike, the northern slope will contain the most moisture, and on that account be best for the ordinary farmer, who is apt to neglect it too much. A north slope with high, thick timber at the north end is not so good as where the orchard does not extend to

the bottom of the slope, leaving a long, open descent below, thus affording a free circulation of air to the orchard.

Let us emphasize the fact that all kinds of trees grow very much alike on all kinds of slopes, all other things being equal, such as soil, protection from wind, sun, fire, etc.

VARIETIES.

Having got ready to plant, if for profit and you live west of a line running between Lake Pepin and Rochester, take my advice and of the varieties of apples now to be had plant nothing but the Duchess of Oldenburgh; when you are able to get the Itasca and Peerless, plant them. If you plant for home consumption, plant five Tetofskys, twice as many Duchess, five Wealthy, and of crabs and hybrids two Early Strawberrys, five Transcendents, five Whitney's and three Meader's Winter. These are the three best apples and four best crabs of thoroughly tested varieties. There are other hardy crabs, but bearing so little as to be unprofitable. The Tetofsky will not bear much, but are early and good. The Wealthy will bear considerable fruit, if cared for as I am about to direct.

PLANTING.

Secure sound trees not exceeding three years of age and with good roots. A tree grown in Minnesota one Summer from the graft, cut back to the ground next Spring, making a growth of three and a half feet that Summer, healed in the ground that Autumn, is a good tree to plant; or a well-grown, perfectly sound tree two or three years old and having no scars on its body where limbs have been trimmed off. See that the bark be perfect. Be sure you buy of a Minnesota nurseryman, and one that does not pretend to be doing an immense business. He may be doing so much that he knows nothing of your little order and trusts it to Tom, Dick or Ole to fill.

If you plant to raise apples to sell, either plant root grafts, three grafts eight inches apart where your tree is wanted, or else buy selected one or two year old trees. Be sure they are dug in the autumn. A tree that stands out through a Minnesota winter, except it be a winter like 1887-8, is not fit to be transplanted in the spring. To get your trees home safe be sure that they are well wrapped up root and branch as soon as they come into your hands; secure them from wind, frost, and sun; keep the roots moist until they are planted; see that the bark and roots be not bruised in any manner, for in our rig-

orous climate a little bruise will work much damage to a tree. Should there be any bruised cover with wax, the preparation of which I will mention further on.

In planting apple trees plant early in the spring, as soon as places can be dug for the roots. It is very important that the tree should get a good healthy growth the first year, so that it may start life with a good reputation. This is as necessary to a tree as to a man. If the top makes a good growth the root will also. Plant early so that the ground will be settled and the roots ready to lay hold of the ground at the first opportunity. Unless the soil is wet by recent rains use plenty of water, so that the soil will be so thoroughly wet that the earth will settle around every fibrous root. One advantage in the use of water is that the soil settles immediately, without waiting for rains which may be long delayed.

Plant each tree so that the top of the root will be about six or eight inches below the level after the loose earth settles. In light soil, 10 to 12 inches. Frost and air penetrate sandy soil deeper than heavy soil, and the mechanical action of air with frost is very injurious to the roots of trees in dry soil. Set each tree leaning slightly toward the 2 o'clock sun. If you use water in planting do not fill the hole quite full of earth. The next day fill in with soil without water and press it down firmly. Then throw about three inches of loose soil on top. The roots of each tree should be straightened to their natural position; the ends of each bruised root be cut smooth with a sharp knife. Nothing but well pulverized soil and water should be used in planting the tree. If the tree has branches place the longest and heaviest branch to the southwest side of the tree; keeping in mind that the top of the future tree must be more than half on the south side of the trunk. The tendency of a tree in this climate is to grow toward the northeast, and you will be obliged to keep a sharp lookout every year in order to direct the growth of the tree's center and south limbs, by cutting back the north limbs. It will be sometimes necessary to drive a stake and tie the leader and largest south limb to it, in order that it may be started in the right direction. Remember, that strict attention to these little things is often the dividing line between success and failure.

Why do we wish the tree trained toward the southwest? Because the unbroken rays of the sun shining on the body and forks of the tree is one of the most injurious things that can happen to it. And the easiest and cheapest way to prevent it is by making the top low and thick on that side. Five minutes work on each tree now spent in

shaping the top will save a great amount of labor in setting up boards or constructing other protection during the ensuing fifteen years. A stitch in time saves nine applies with ten-fold force in this place. Shape the top low, three feet is high enough, trim every year for four or five years in June, then you will cut only wood of the same years' growth and leave no wounds.

PROTECTION.

Plant trees, if Dutchess, sixteen feet apart, north and south, and twenty to twenty-five feet apart the other way. Cultivate the ground often during the early part of the season, stirring the soil to a depth of six inches until the twentieth of June or first of July, then mulch with refuse hay, straw, cornstalks or like material. This should be spread about the tree to a distance of four feet from the trunk to keep the ground cool and to keep down weeds. The object is to make the trees grow all they will during the first part of the season. If the soil is not in good condition add well rotted manure in late autumn as a mulch. Ashes strewn broadcast over the ground in early spring will be very beneficial.

The first and second autumns after planting remove mulch from contact with the tree, throw a mound of clear earth not less than six inches high around each tree. Then wrap the body up with rye straw, cornstalks or gunny sacks. And let it remain on till the last of April. This is to keep the sun from injuring the bark during the winter and spring; and it is all important in keeping the heart of the tree sound. Every autumn thereafter until the top shades the body set up boards in September to keep sunlight from reaching the body of the trees, or when you wish to give the tree especial care put on bark from poles peeled in May or June. For this purpose use poplar, elm, butternut or white birch. Fasten this on and leave it until the next May. Now do not plant an apple tree unless you are willing to do this. If you neglect to do so until the top is large enough to shade the trunk, the south side will be injured. Then there can be but little growth on that side, and the top will incline toward the northeast and give still better opportunity for injury from the sun. Few think it is the heat of the sun which kills our trees off, but it is to a large extent. My father informs me that he saw in 1873 a number of pear trees protected from the sun on the previous winters, and that came through all right, while those exposed to the sun were killed. Of course they would not have been killed if the cold had not been extreme, and on the other

hand the others would have been killed if the sun had shone on them.

It is my opinion that the sun injures the bark and cold injures the wood of a tree. We have many trees shaded by evergreens, the wood of which was entirely killed by the winter of 1884-5, but their bark is as green and healthy as ever.

Here let me refer to an article in the *Farmer*, of Oct. 21, 1886, by C. Gaylord. He says: "Our Fameuse are all dead, or nearly dead, except one. This now appears in fair condition. This I attribute to the tree being set close on the north side of a picket fence some twelve feet high. It has strong, hardy roots, properly grown from the stem of the tree." The article was written on "Fruit Trees on Their Own Roots."

In reply to the same in the *Farmer*, Nov. 25, 1886, we read: "First. A fence twelve feet high affords considerable shade to the ground immediately north of it, which shade prevents the evaporation of moisture from the soil, and the trees standing in the shade of the fence had the necessary amount of moisture to enable it to withstand forty degrees or more below zero, inasmuch as the frost was taken out of the body of the tree while in the shade. Second. Had the fence been taken away before the south side, or any part of the tree had thawed after the intense cold of that winter and the frost had been taken out by the sun, the tree in question would have gone with its fellows, even had it been on a hardy root." The same writer, a Mr. Brewster, further says: "The second great factor in the killing of trees is a lack of sufficient moisture in the soil to enable the roots and leaves of the trees to properly perform their functions in storing up in sufficient quantities those elements which enable it to withstand extremes of heat and cold."

I think he takes a right stand. Sunshine in winter and spring, roots in dry soil, with the aid of cold, kill our trees. Cultivate the ground among the trees for four or five years. Raise small fruits (beans or potatoes), but not corn, since corn shuts out the wind and causes the intervening soil to become too hot. Add as much fertility to the land as the crops extract. Use short whiffletrees when cultivating or plowing, and never let a whiffletree touch a tree. Don't allow any kind of crop to grow within six feet of a tree, but stir the earth around the trees often, and five or six inches deep, for four or five years. The feeding roots will by this time have extended eight or ten feet in all directions, and cultivation must cease. A good mulch to a distance of five feet from the tree will now prevent growth about the tree and be better and cheaper than further cultivation.

FERTILIZERS.

Lime is one of the chemical elements of the apple tree, and unless your soil has it in abundance, it may need some by the time the trees begin to bear. Some soils, if very sandy, may need a pound of sulphur to each tree, sown broadcast with lime and harrowed into the soil, alkali being necessary to render the sulphur soluble. Crabs and Wealthys will be most benefited by its use. Iron scrapings from a foundry buried in the soil six to ten feet from a tree are also valuable. You don't know what your soil may lack. Bury dead animals four to five feet beneath the surface and not nearer the tree than six feet; provided the orchard is not above or near your well. Don't expect to get much fruit without adding fertility to the soil. If there is grass in the orchard, mow it and allow it to remain for mulch.

If you have apples for sale, pick by hand and take to market in baskets in a spring wagon if possible. Make poor apples and crabs into cider vinegar rather than try to sell them on a full market. If you have a large supply of Duchess on hand keep in an ice house till you have a market.

Farm, Stock and Home says: "Success in farming is the result of proper business methods." The same holds true of fruit growing.

Ours is a windy State, and apples are liable to be blown from the trees in summer. A windbreak is needed the nature of which will depend on the location of your orchard. In our city of Faribault our heavy winds in summer and autumn are from the west and south. If your location admits of it set two rows of European larch one hundred feet from your orchard. Twenty feet outside of them plant two or more rows of evergreens. Use Balsam Fir, White spruce, and White or Scotch pine. If you are in a very windy part of the State, plant two rows of white willows twenty feet apart ten rods from your orchard; inside of these fifty feet plant two to four rows of evergreens.

On account of the infinite variety of locations and slopes it is hard to lay down any arbitrary rule for protection; and the planter must fall back on his own good sense, if he has any, and adopt means to ends; ever keeping in mind that fruit trees need lots of air and room; the closest protection on level should be on the south side; and that drifting snow must be guarded against, by stopping it outside the orchard.

Last summer while canvassing west of the Big Woods I saw many orchards entirely ruined by the drifting of the previous winter.

Nothing but stumps left. This was because the windbreak was too close to the trees.

PROTECTION FROM RABBITS.

Rabbits are a fruitful source of annoyance to a young orchard. To protect the bodies of trees set laths or split staves around the bodies of the trees, and tie the tops fast to the tree by means of a cord. But it is often the case that the snow is so deep that rabbits can walk among the branches of the trees. If such be the case they must be trapped, poisoned or otherwise destroyed. Rabbits are easily caught in figure 4 traps. Bait the trap with a sweet apple. Then catch him. Now proceed to eat him. But the easiest way to destroy them is by the use of poisoned fragments of sweet apple placed on sticks a few inches above the snow. This is very effective. The animal in question is usually found beside the apple or outside it.

Borers sometimes do considerable damage in the vicinity of poplar and hickory timber. They are hatched from the larvæ deposited by a beetle during the summer. The beetle splits the bark from three quarters inch to an inch and a half in length, and deposits the eggs under the edge of the split bark. The scratch will resemble that made by a cat. An experienced eye will detect the scratch at once. They are generally to be found on the upper part of the trunk or lower half of the large limbs. There will generally be from four to eight eggs under the bark. Take the back of a pruning-knife and draw down over the scratch, pressing hard on it. You can hear the eggs crack distinctly. If unmolested the eggs will hatch in about ten days from the time when they were deposited. The little fellow begins to eat at once, and its presence may be detected by pellets of dark colored sawdust exuding through the bark. An examination will discover one or more little worms at work under the bark. Either cut them out at once, or drown them by holding a large rag over the spot, and pouring on it warm soapsuds for ten minutes. If the borers have been at work for some time, there will be some dead bark. Remove this, and then take a wire and probe the holes you find there. Generally the wire will reach and kill the worms. After killing the borers be sure and wax the wounds over.

CODLING MOTH.

To the orchardist expecting to realize money from his orchard, to know how to overcome this prevalent and destructive pest is of the

utmost importance. So great are its ravages in Illinois that the loss from its depredations is estimated at nearly five millions of dollars annually. The means of overcoming it are simple. Take a 50-gallon barrel; into it put 32 gallons of water; add one-third pound London purple, or one-fourth pound Paris green. These poisons should be thoroughly dissolved in water before adding. With a force pump and hoze and nozzle made for the purpose, spray the trees affected, using about one pail of the poisoning mixture to a tree. This should be done directly after the falling of the blossoms, and then again in two weeks, or before the little apples hang down.

When the trees grow old, pigs are a good thing to keep among them. For aphids or green lice on the new growth, boil up tobacco stems, and while the liquid is warm dip the affected limbs in and keep immersed for a few seconds, and repeat in two or three days. Very strong warm soap-suds will answer.

Trap and poison pocket gophers.

OLD ORCHARDS.

Now I will address a few lines to the orchardist who already has an orchard or a part of one.

If you have some old, sickly trees of Duchess or Wealthy, cut all the sickly limbs from the Duchess about two feet from the trunk or main branches, cover the wounds with wax, wash the bodies well with hot soap suds or with a whitewash made as follows: put into a barrel one peck of lime and two pounds of sulphur; pour onto the mixture four pails of warm water; stir till well mixed. Wash the trunk and large limbs of the tree with this while hot, using an old broom for the purpose. Manure them well to a distance of from four to ten feet from the trees. Cut your old Wealthy off at the ground and let new branches spring up. In four years you will have good bearing trees. Save the seeds from the largest and latest Duchess apples. Plant them and care for the young trees that grow from them.

Grafting wax may be made as follows: Melt one pound of white resin very slowly; take from the stove and stir in one tablespoonful of turpentine. Then with constant stirring pour in alcohol slowly until the mass is about as thick as syrup — about five ounces of alcohol to one pound of resin. Another wax is: tallow, 1 ounce; beeswax, 1 ounce; resin, 2 ounces; melted together. Always wax a wound as soon as it becomes dry. In using this wax in cool weather, keep in a bucket of warm water.

And now, my friends, what more can I say? If my article is long, I don't see how I can leave anything out without injury to my subject. That part relating to varieties does not refer to most favorable and favorable localities. I will add that if you are seeking a location for growing apples with the greatest success, go into Eastern Winona or Houston county, and in the selection of your varieties for planting be governed by the advice of the Hon. J. S. Harris, of La Crescent.

Learn how to graft from an expert or from any of the good farmers' papers, which you will take if you expect to be a good fruit-grower.

Mr. Latham, from the Committee on Prize Essay on Strawberries and Raspberries, reported that papers were presented as follows: By Miss Lulu E. Danforth, Northfield; Miss E. Bessie Vandervort, Man-kato; A. N. Wilcox, Hastings; John Lyons, Minneapolis; S. A. McHenry, St. Charles; R. A. Pierce, Minneapolis.

They award the prize to Master A. N. Wilcox, age 18.

STRAWBERRY AND RASPBERRY GROWING IN MINNESOTA.

By Archie N. Wilcox, Hastings.

STRAWBERRIES.—HISTORY.

The strawberry derives its name from the Anglo-Saxon "strahen," or "straw"—to scatter, as applied to the berry from the straying or scattering habits of its runners.

Its geographical range extends over both continents, from the frigid zones to the equator. The first allusion I have found to its garden culture is about A. D. 1480.

In the play of Richard III., Gloucester says: "My lord of Ely, when I was last in Holborn I saw good strawberries in your garden then; I do beseech you, send for some of them."

A hundred years later there was a garden in Holborn, then the most aristocratic part of London, among whose products four kinds of strawberries are mentioned.

Lord Bacon says: "As we have housed the exotics of hot countries, lemons, oranges, and myrtles to preserve them, so we may house our natives to forward them; and thus have violets, strawberries and peas all winter."

This idea of hot-house culture seems to have been adopted to some extent, for Switzer, writing in 1724, informs us that strawberries and cherries have been forced by bottom heat from time immemorial by the London market gardeners.

Early in the seventeenth century the strawberries from Virginia were introduced into both France and England, but do not appear to have thriven to any great extent, for in "Langley's Pomona," published in 1729, only three kinds are mentioned.

Others were introduced about this time from Chili and Surinam, one of which, the "*fragria grandiflora*," has been reckoned by botanists as a distinct species.

Their wholesome and medicinal qualities have always been highly approved, and no less authority in the botanical world than the great Linnæus recommends them for the cure of gout, and attributes his cure from that disease to the free use of strawberries.

Old Dr. Parr, when on his death bed at the age of 120 years, it is said, exclaimed: "If I can only live till strawberries come," and seemed to think that their presence was the one thing needful to effect his cure.

While highly approved, but little progress was made in its culture until within the last half century, during which time it has been developed from the small, sour fruit of our fathers into the sweet and delicious "ideal of the epicures" and often made to attain the weight of a quarter of a pound and more.

SOIL.

With its wide range of habitat and extended list of varieties, the strawberry will succeed on any good, rich or well-fertilized soil, and if the right kinds are chosen, seems equally at home on light sand or strong, tenacious clay. If we wish to plant on clayey land, we must look carefully after the drainage; for we must avoid excess of water as well as drouth. Yet the strawberry will thrive, especially on sandy land, with an amount of moisture that would prove disastrous to many other cultivated crops.

Rev. E. P. Roe says: "Though we give our strawberries plants everything else they need, our crop of fruit will still be good or bad in proportion as we are able to maintain abundant moisture during the blossoming and fruiting season." If this can be attained by irrigation or in any other way, then we may look for the best results from a given outlay on a light, sandy, easily cultivated soil. We must not allow the long hot days of June to check the growth of plant and fruit

at a period most critical in the proper development and perfection of the crop.

With this precaution and with such varieties as are best adapted to such locations, with the Crescent, alternating with the Chas. Downing or Countess as a fertilizer, the ordinary market grower will be most likely to succeed; or, if a single variety be preferred, perhaps there is nothing that has yet been thoroughly proved that is more likely to give satisfaction than the old Wilson. One of the greatest recommendations of this light soil, and why I like it best, is its easy cultivation; for we can certainly tend two acres during the season as easy as we can one on a strong, wet clay.

Soils are like individuals; every one possesses a distinctive character of its own unlike every other, and I am willing to admit that the largest and best crops of strawberries I ever saw grown without irrigation were grown on a moist, heavy soil underlaid with clay. To succeed with this, however, we must use an entirely different system of cultivation, and instead of matted rows use hills and grow strong, vigorous varieties like the Jewell and Sharpless, or Manchester and Mount Vernon, that will form a large number of strong fruit crowns from a single root.

VARIETIES

When the Wilson strawberry was introduced to the public some 30 years ago, in its primitive vigor, it so far surpassed all other competitors in the good qualities necessary for an ideal market berry, that it fairly revolutionized the business of commercial strawberry growing; but with old age its vigor declined, and it must now yield to its younger rivals the leadership it has so long maintained. Of the varieties suitable for the climate and soil of Minnesota, which it is safe for the large growers to plant with reasonable assurance of success, (always remembering to plant the perfect flowering variety, as often as one row in four among the pistillates,) I would recommend the Crescent, a large, conical, scarlet berry, of good quality, hardy, vigorous, and healthy, and very productive, (season middle of June,) but with the fault of berry rather soft, and a pistillate or obtuse staminate blossom. Manchester, a large, round, conical, crimson, firm and good late berry, (season the last of June,) with pistillate blossom and liable to rust. Mount Vernon, a large, round, conical, scarlet, bisexual late berry, of good quality, steadily growing in favor where best known. Season last of June. Countess or Downer's, medium, round, conical, scarlet, very good bisexual, of firm texture, hardy and vigorous.

Season middle of June. Sharpless, a very large, oblong, conical bright red, excellent berry, liable to grow coxcombed; plant bisexual; strong and vigorous; needs hill culture and protection against spring frosts.

Of the new varieties many are very promising, and seem destined to surpass everything that has gone before. But when we remember the great cry that has accompanied the advent of so many that have proved disastrous failures, we should hesitate to commend any of them, except to amateurs for use in an experimental way. To such I would say, try the following list, some of which I shall test for my own satisfaction: Jessie, Jewell, Alpha, Arnold's Pride, Cornelia, and Parry. Alpha for early and Cornelia for late will extend the ripening season for six weeks or more.

CULTIVATION.

To grow a crop of strawberries alike pleasant and profitable to the grower will require the most careful attention and thorough culture at his command.

For most varieties the matted row system with judicious thinning is best, while some like Sharpless, Jewell, etc., will not succeed except in hills.

For matted rows prepare your ground as you would for an onion bed, smooth and fine, as early in the spring as possible. Mark your line by running a red string through it every eighteen inches, drawn tight across one edge of your field, close to the ground for the first row. Prepare your plants by thoroughly cutting not more than one hundred at a time, and if your ground is full of cut worms a little Paris green in the water will make itself manifest. With a small boy to drop a plant at every mark, then follow with a trowel and set your row about three inches from the line. Remember to spread the roots as much as possible, and press the dirt very firm around them. Draw your line for the next row four feet from where it was before if early in the spring, or three and one half feet if later, and repeat the operation. In this way it is an easy matter to set an acre a day, and the plants will thrive better than in any other way.

The after culture will consist of keeping the ground clean of all weeds and grass with the cultivator and hoe, and as nearly level as practicable, continue this until about September first, when they should be properly thinned and left entirely alone for the formation of fall or fruit roots, on which will depend the abundance of next season's crop. After the ground is well frozen apply mulch for winter protection,

and rake it between the rows in the spring if there is room for it there, if not remove the most of it, and they will need no more attention until time for picking.

After picking is over it will sometimes pay to harrow the field and clean it out for another crop, but this is generally a poor policy, and the better way is to plow them under and plant the field to some other crop.

Good plants for another field may be obtained by thinning the first year's growth before the field has ever borne fruit; but never take them from a field after it is exhausted by the production of a crop. We must always select some bisexual variety that will blossom at the same time when we plant the Crescent or a pistillate flowering kind for the main crop.

PICKING AND PACKING.

The cost of picking a large field of strawberries will be about one and a half cent per box for the pickers, besides the necessary supervision. Furnish each picker with a carrier holding four or six "Hallock" quart boxes, and have them returned to the packing house as soon as full, to avoid exposure to the sun. See that they are picked clean, and, if the rows are wide and thick, place two pickers, one on each side. See that the berries are picked, not pulled, from the stem and handled carefully to avoid jamming. Pack in sixteen or twenty-four quart crates, which can be procured, with boxes of the best white wood, from Michigan for about twelve cents for the sixteen quarts and seventeen cents for the twenty-four quarts.

HILL CULTURE.

For hill culture, which is essential to some of the large kinds, we may use primary plants, which may be obtained from your plant beds about the fifteenth of July or the first of August (which should be entirely independent of your fruiting beds) by cutting away all the fruit stems as soon as they appear in spring. Set these about sixteen inches apart each way, and cultivate thoroughly not later than September 15th. Cut away all runners. Mulch after ground freezes, and leave it where it lies in the spring, except to clean a small place over the crown of each plant, and the result will often prove a pleasant and profitable surprise to the grower.

PROFIT.

With a good location, suitable soil, thorough culture and intelligent

management, the pomologist may reasonably hope for a crop of three or four hundred cases per acre, providing everything is in the most favorable condition. Anyhow, he may enjoy the pleasure of anticipating an immense crop of mammoth berries as a reward for his efforts. But if the drouth comes in June, or unseasonable rains, or worms or bugs destroy, and he secures but one hundred, he may still feel that he has done better than his brother who grows wheat at sixty cents or corn at thirty cents per bushel.

RASPBERRIES.

Blackcaps (*Rubus Occidentalis*), European Red (*Rubus Idæus*), Native Wild Red (*Rubus Strigosus*).

The first of these species includes all our native blackcaps, whether black, purple or white. They propagate themselves by rooting the tips of the branches of the current season's growth, and not from root cuttings or suckers. The two latter species perpetuate themselves from root cuttings or suckers, and are distinct varieties. There is a small class of hybrids, originated by cross fertilization between these two, which may be produced by either tip-rooting or suckering. Of these the Caroline alone is worthy of cultivation.

The common name of raspberry is derived from the stahan *rasp*, probably because of the roughness of the wood. In Italy it has been cultivated in gardens since the time of Paladine, a Roman agricultural writer of the fourth century. The name "rasps" is still used in Scotland. The best varieties of blackcaps for general cultivation in this climate, are the Tyler or Souhegan for early, and the Ohio or Mammoth Cluster for late berries. Doolittle is good when young, but loses productiveness with old age.

With a desirable location and adequate winter protection, the more tender Gregg or Hillborn, or Shaffer's Collossal, will amply reward the extra pains its cultivation requires. Of the red kinds, I would place the Turner at the head of the list, followed in the order named by the Cuthbert, Marlboro, Brandywine, Thwack, and Philahelphia. Of these, the Turner, a medium, round, bright red, early variety of excellent quality, a strong grower, hardy and productive; and the Cuthbert, a large, round, crimson, firm, late variety, good quality and productive, but less hardy than the Turner, I would alone recommend for general use.

Raspberries will thrive on almost any well-drained soil of moderate richness, but wet land is always injurious and often fatal to them.

Plant in late fall or early spring, in straight rows, seven feet apart, with bushes three feet apart in the rows. If planted late in the spring, the tender shoots are liable to retard future growth. For the first season give clean culture, and, if desirable, other crops may be grown among them without injury.

Mr. Harris, from the committee on prize essays on blackberries and dewberries, and currants and gooseberries, presented the following report:

The committee to whom was referred the essays, written by persons under 25 years of age, upon the subjects "Blackberries and Dewberries in Minnesota," and "Currants and Gooseberries," would respectfully report that they have carefully examined the essays on the above subjects, and made the award according to their unbiased judgment. We find three competitors for Blackberries and Dewberries, and have awarded the Society's prize of \$25 to Master Burton T. Wilcox, age 16 years. The paper is well written, and is practical as well as clear in its description of methods of propagation, planting, cultivating, protection, training, picking and marketing. We congratulate the author upon the good fortune of being "born (not made) a horticulturist," and trust that he will meet with such pleasure and success in the pursuit of horticulture that all thorns shall bear roses, and briars bow their fruit-laden heads to him.

We also recommend that the essay of Miss Edith A. Kellogg, of Janesville, Wisconsin, which is also an able and valuable paper, be published in our volume of Transactions, and that the Society do extend to her a vote of thanks, and elect her an honorary member of this Society for the term of five years.

We find only one paper on Currants and Gooseberries, written by S. A. McHenry, age 23, and report that he is entitled to the prize offered by the Society of \$25.

J. S. HARRIS, A. W. SIAS, WILLIAM LYONS,	}	Committee.
--	---	------------

GROWING BLACKBERRIES AND DEWBERRIES IN
MINNESOTA.

By *Burton T. Wilcox, Hastings.*

SPECIES.

High Blackberry (*Rubus Villosus*). Dewberry, (*Rubus Canadensis*).

Both these species grow abundantly in the wild state all over the United States south of latitude 45 degrees, and are the parents of all our cultivated varieties. Stems three to ten feet long, pale green to dark brown color, and covered with strong, sharp prickles; does best on rocky or sandy soil in a wooded region; flower racemed, long, with short bracts; fruit oblong or cylindrical; high blackberries, strong and erect canes; dewberries long, low and trailing in habit.

Some hybrids have been successfully produced by cross-fertilization between these two species, whose descendants have proved our best market berries. But the difficulty encountered here by the fruit-growers of Minnesota is in the want of hardiness, characteristic of both parents. Still we may hope, when our worthy pioneers in pomology have devoted one-half the energy and effort to produce hardy varieties of blackberries which they have given to the equally tender apple, to see them successfully grown in every county of the State.

The blackberry and dewberry are so near alike in the requisites for their successful cultivation, that I shall consider them together in a general way in the notes which follow.

With its wide geographical range the blackberry seems to thrive upon almost any kind of soil, and will resist drouth better than any other of our small fruits, and my preference for a moderately light sandy soil would only be because in such a location it could be much easier cultivated, especially when laying down for winter and would be more likely to fully ripen the young wood before the frosts of winter came upon it; still the Snyder will often lose its foliage on sand. When you are choosing a location bear in mind the fact that a field of blackberries well established will continue to improve for many years, and select just what you wish to use permanently for that purpose.

Plow deep, even subsoiling will pay, and work fine as you would for a premium crop of corn. Then mark in straight rows seven feet apart, and set three feet apart in the row, be sure to spread the roots when setting and press the dirt very firm about them. Set full as low as the plants formerly stood, and you will have little difficulty

about their growing. Early in the spring is the best time for setting, before young shoots start. If you wish to plant potatoes or beans among them; it won't hurt them as bad as a crop of weeds.

When the canes have reached a height of two feet the first season, or three and one half feet afterwards check the growth of the main stems by pinching back, or if they get the start of you, cut them back to the desired height. This will cause the formation of lateral branches and give much better results than it will to allow a tall and unchecked growth.

The best way I have ever seen to do this is to walk on each side of the row with a long sharp butcher knife, strike quickly right and left at every sprout that shows its head above or outside your ideal row. This is a much faster as well as better way than the old style of pinching back with the thumb and finger; and it enables you to keep them as even and handsome as a well turned hedge row.

As soon as picking is over remove all the old wood by cutting close to the ground, and at the same time thin if necessary to what you desire for your next season's crop, four or five good strong canes in a hill or one in six inches if grown in a row is better than twice as many. After the old wood is removed one good thorough cultivation of the ground is all that is necessary, as we wish to check the growth in time to harden the wood rather than induce a late and tender fall growth.

If this part has been well done, the ground made smooth and mellow, and the canes properly thinned, it will greatly facilitate the next operation, which is the most important of all to the successful culture of blackberries and dewberries in Minnesota.

While the strawberry and raspberry are generally hardy, and will sometimes return good for evil, rewarding their owners for their neglect, the blackberry is far more tender, and naturally grows as an undergrowth among the trees somewhat protected from the influence of our prairie zephyrs. So while some hardy varieties with small berries, and more like the type of their wild ancestors will stand our climate fairly in favorable locations, we must not expect our better varieties to do so, and our only safety lies in regarding them as tender, and giving them all the winter protection possible. I would rather risk the tenderest blackberry with a good covering of dirt than the hardiest without it.

Pinch back between two and three feet high to increase the growth of lateral branches, and stop cultivation in season to harden the wood before freezing weather. In spring prune laterals to one foot in

length, and if injured cut back to sound wood. And here I might say take no risk of losing a crop by winter-killing when they can be so easily saved by covering over, the same as the blackberry. We may rest assured they will pay by extra yields for all the extra labor, even if it is not necessary to save the crop. As soon as convenient after the bearing season is over, cut out all the old wood and the new shoots to four or five inches in each hill, always bearing in mind that all raspberries are perennial, and that we must lay the foundation for the next season's crop by securing a vigorous growth of healthy shoots at this time. Besides, a careful pruning now will greatly assist in the after culture and winter protection.

We cover by removing several inches of earth from one side of the hill, so that the plants may be bent over by bending the roots, and then cover the whole plant with earth. This must not be done until or near freezing weather as possible, and should be removed early in the spring. After lifting them in the spring, cultivate shallow but thoroughly. The best mulch to guard against drouth is three or four inches of fine, loose, easily stirred soil. When the time for picking arrives, gather as often as once in two days, and pack directly in the boxes in the field when picked. For blackcaps, use quart boxes and 16 quart cases, and for red, pint boxes, and 24 pint cases, and market as soon as practicable after picking, as they are never better than when first taken from the bushes. Crates will cost, with boxes, 12 or 14 cents each. There is probably no branch of horticulture that pays better for a series of years than a good field of raspberries, as they are a comparatively sure crop, besides always bringing a fair market price, as their soft natural condition and rapid deterioration prevents our southern neighbors from filling our markets with hundreds of carloads in a season, as they often do with the firmer strawberries and grapes.

In conclusion I would say, while I have worked with great pleasure in our berry fields, and enjoy both their cultivation and the opportunities for study they afford, yet this is my first, and I fear my last, attempt to describe our various operations. Besides on every page I find, on reading it over, that I have omitted many things which time and limited space will not permit me to rewrite and describe. Therefore I will close by wishing prosperity and extended usefulness to all the members of the Minnesota Horticultural Society, hoping when my school days are over to be worthy to sit at their feet and learn wisdom from their councils.

We cover the canes late in the fall as possible before freezing weather, and it may be done by one man, or what is better, by two

working together. It is always desirable to lean all the bushes in a row in one direction, and this is done by thoroughly loosening the dirt, and moving two or three spades full from the side we want them to go; then place a fork on the opposite side, and as you press them over place your foot on the canes next the ground so as to press them all together, and avoid breaking by binding them in the roots and below the surface of the ground; fasten the tops down with a shovel-full of dirt, then press down the laterals and cover thoroughly from root to top with two or three inches of dirt.

Some varieties, like the Wilsons and Dewberries, of low, slender habit, cover much easier than those of larger and more woody growth. Some leave the latter after fastening the tops, which may do in favorable seasons, but large fields of Lawtons left in this way last winter in Michigan were killed when they stuck out of the ground by a hard freeze when there was no snow over them.

In the spring, gently lift the top of the bush from the ground with a fork, and after shaking off the dirt, leave it in its leaning position for a week or ten days, during which time it will gradually assume a more erect attitude; then go through the field with shovel and shears, placing the bushes erect in line with a little fresh dirt at their bases, and pruning away all injured or superfluous wood, and you will have a field that will gratify the eye of an artist and the taste of an epicure, as well as the avarice of the owner.

Keep your field clean and cultivate fine until the first blossoms appear, and they will be better to be let alone until after picking is over, unless it is necessary to stir the surface lightly to counteract the effects of drouth, in case of which constant cultivation will often save the crop. The best mulch known is to have four inches of finely pulverized soil all over the top of the ground.

Blackberries should be picked two or three times a week after they begin to ripen. This is best done by a picker on each side of a row, armed with a carrier and six quart boxes each, and will usually cost about one and a half cents a quart, or one half the cost of strawberries and raspberries.

Pack in sixteen or twenty-four quart cases and they are ready for market and will ship five hundred miles or more in perfect condition.

Twenty-five years ago there was but one prominent variety, the Lawton, in cultivation; this long remained, like the Wilson strawberry, far in advance of all competitors, but with the present stimulated interest in pomology several newer varieties promise to supplant it in popular favor. Among these — the most hardy and best adapted

to the soil and climate of Minnesota, besides possessing many of the good qualities desirable in a market berry — I would recommend Snyder, Taylor and Ancient Briton, for a succession from early to late, as likely to succeed as any I could name. Stone's Hardy is small, but well liked in some places. Western Triumph is hardy, and that is all the good I know of it. But if God should decree that I should pass my life in Minnesota, I shall endeavor to grow the Wilson's Early, Wilson's Junior and the Lucretia dewberry, as the largest, earliest and best of all the blackberry kind. Still they are all tender, and knowing they are tender we propose to take care of them. Who would think of succeeding in dairying if they left a herd of fine Jersey cows to "rustle" for themselves through the winter around a straw stack.

The best plants for setting may be obtained from root cuttings by dividing the roots into sections of two or three inches in length and planting in soil the spring before we want to use them. These make roots freely if the soil is moist and pressed firmly around them, and are far preferable to plants obtained from suckers in an old bearing field. If you are obliged to buy them, they will cost from \$3 to \$10 per 1,000, standard varieties.

The profit of blackberry culture depends entirely on our success in protecting them through the winter; for they have no insect enemies and but small liability to disease to cut short the crop. Yet I well remember how a fine field of the "ironclad" Taylor, which my brother and I rented last year in Michigan, failed to give us a single case; and our Western Triumph were no better, while our "*tender*" Lantons and Wilsons, that were laid down on both sides of them, were very fine.

I have known the Snyder, which is best adapted of all kinds to a heavy, strong soil, to produce as high as six hundred cases of sixteen quarts each per acre, but one-half of this is a large yield under the most favorable conditions, while fifty cases was more than the average last year in Michigan.

In exposed locations on our prairies, where the wind would be liable to break over the bushes and injure the fruit, we may protect them by sticking posts about thirty feet apart in the row, and drawing a wire on each side, tight, about two feet above the ground. One of the wires can be easily removed when we want to lay them down; or the dewberries may be trained to these wires. But these precautions may be unnecessary if we trim back more, and make a low thick bush, instead of a taller and more slender one.

Blackberries must not be neglected at any period of their cultivation, and the beginner will derive more satisfaction from a small field well cared for than from a much larger one if it is allowed to get the start of him; for of all slovenly and unprofitable fields a lot of unkempt and neglected blackberry briars will take the prize.

BLACKBERRIES AND DEWBERRIES IN MINNESOTA.

By Miss Edith A. Kellogg, Janesville, Wis.

What varieties of blackberries are best adapted to culture in Minnesota? Have we any variety hardy enough to bear well in Minnesota without winter protection? No. The best varieties for culture are Ancient Briton, Snyder and Stone's Hardy. I should plant Snyder for early, Stone's Hardy for medium, and Ancient Briton for late. I would prepare the ground by plowing deep, manuring heavily, forty to sixty loads per acre, and thorough cultivation. Have the rows eight feet apart, and the plants three feet. Keep them in hills, and do not allow them to spread over the ground. Keep all the suckers down if you want choice fruit (this is easily done with a horse and cultivator), and pull out where they grow too thick. Do not allow over five canes in a hill. All blackberries should be protected in this latitude. A spadeful of earth may be removed on one side of the plant, binding the plants down till the tops touch the ground; then fastening down with a little earth, and covering with dirt, marsh hay or corn fodder; or even coarse manure will answer the same purpose where there are no mice. Remove the covering in the spring as soon as freezing weather is done. Raise them up with the fork, and press the dirt firmly with the foot on the side where it was removed in the fall, and tie to a wire stretched on posts, two and a half feet over the row. Work the coarse manure well in under and about the bushes; this serves the double purpose of choking weeds and grass, and keeping the ground moist during the scorching days that, as a rule, are to be expected in August. Pinch the new canes back to about three feet and three and a half feet in June and July. This causes them to branch out. Do not prune the laterals, for if you do, you will cut off the part where our best fruit grows. Take off nothing but the top of the upright cane. The cost of covering is from six to ten dollars per acre. Some think that it is better to place a trellis on each side of the row, and the wires about two and a half feet from the ground, and stakes twenty feet apart. One wire on each side is sufficient. Dew-

berries require the same culture and care as blackberries. The best varieties are Lucretia and Bartell's Mammoth. Cover with marsh hay, and in spring tie them to a single wire eighteen inches above ground.

CURRANTS AND GOOSEBERRIES IN MINNESOTA.

By S. A. McHenry, St. Charles.

Currants and gooseberries though not the most valuable of fruits have their places to fill as well as the strawberry and the more delicate fruits.

They are natives of this country, and are generally found on damp, heavy soil when growing wild. As they by nature have chosen a damp heavy soil it would be well to give them a similar soil when planted for cultivation. When such a soil is not to be had, much may be done to insure success by deep plowing, subsoiling, and by an abundance of mulch around the plants throughout the summer. Currants and gooseberries require a great amount of nutriment, and should receive an annual dressing of some heavy compost in which muck, leaf-mould, wood ashes and cleanings from a cow stable are largely present. The best time for transplanting the bushes is in the fall any time after the wood is ripe, but if set very early in the spring nearly the same results may be obtained. They should be planted in rows four feet by six. By planting this distance they may be cultivated both ways.

A hoed crop may be planted between the rows the first two years. The plants should be set about two inches deeper than they stood in the nursery row. If two year old plants are set, fruit in paying quantities may be expected two years from time of setting.

After the first three years they will require less cultivation and more mulching. They may be trained in either the bush or the tree form, but if fruit alone is the object the former method is best and is most natural for the bushes and requires less labor. If for ornamental or other purposes the tree form is desired it would be well to train them so from the cutting, by removing all but the top bud from the cutting at the time of setting. Young wood produces the best fruit. The old wood should be cut out as soon as it begins to show signs of weakness and bears fruit of inferior size.

One great advantage of currants and gooseberries over most small fruits is that they may be left on the bushes for some time after they are ripe, but when so left they do not ship as well as when promptly

attended to. They are sometimes picked in quart boxes but are generally handled in baskets of larger size. Currants should be picked in bunches and shipped on the stem. If torn from the stem the skin is broken and they soon decay.

PROPAGATION.

Currant and gooseberry bushes are easily propagated by cuttings and layers. Cuttings are best cut in the fall during the month of September. They are made of the last year's wood and should be about eight inches long, and should be planted at once in a rich moist soil, and the ground pressed firm about them.

Only one bud should be left above ground. Before the ground freezes in the fall the cuttings should be well mulched with stable manure.

Cuttings may also be cut in the spring or may be cut in the fall and tied in bunches and buried or kept in moist earth in the cellar, but they do not root as well set in the spring as when set in the fall.

The following paper was read by Mr. Brand:

THE APPLE.

WHAT MAY WE REASONABLY EXPECT FROM IT IN MINNESOTA?

By O. F. Brand, Faribault.

For the purposes of this article the subjects of cultivation, pruning, location and soil are each too comprehensive to be more than incidentally alluded to.

ORIGIN.

That the common apple is as old or older than the human family there is little room to doubt. Aside from Holy Writ apples are mentioned by Theophrastus, Herodotus and Columella. The latter, who wrote in the early part of the first century, describes three methods of grafting as handed down to him by the ancients, as well as a fourth method of his own. Philip, the elder, who wrote a few years later than Columella, said: "There are apples that have ennobled the countries from which they came, and our best varieties will honor their first grafters forever; such as took their names from Matius, Cestius, Manlius and Claudius." Speaking of apples at Rome, he

wrote: "There were some trees in the villas near the city which yielded more profit than a small farm." Thus, in those ancient times the introducers of a new apple were esteemed honorable among their fellows, and their names will go down to remote posterity as benefactors of their race.

AMERICAN APPLES.

The introduction of the apple into our country dates back to 1629, when seeds brought from England were first planted. On April 3, 1632, Governor's island, in Boston harbor, was granted to Gov. Winthrop, on condition that he should plant thereon a vineyard or orchard. Many of the first trees grown from seeds in Massachusetts lived to be more than two hundred years old. From this date we find that an effort to raise apples was made by nearly all the pioneers of our country, and their efforts were nearly always crowned with success.

The oldest orchard in the West of which I have any knowledge is at St. Joseph, Mich., just across the lake from Chicago. They consist of less than a dozen trees on the banks of the St. Joe river. The seeds from which these trees grew were planted by an Indian trader named Burnett, in 1776. The best of these trees, which are now a hundred and nine years old, stand less than two hundred feet from the river, and not more than four feet above its level. They are still productive.

In Wisconsin apple seeds were among the first things planted. In 1839 G. De Neven planted apple seeds near Fond du Lac. They soon came into bearing, survived the severe winters of 1842 and 1856-57, and were bearing large crops when I last saw them, in 1869.

The success of these seedlings encouraged all to plant apple trees, and that county became famous for its large crops of fine apples. I paid a visit to that locality last fall. But very few of the trees set from twenty-five to thirty-five years are left, and they are Duchess, Talman Sweet and Seeknofurther. The best old trees are now on moist land. The Duchess is alive everywhere.

In stating what our expectations of the future of apple growing in this State are, and what they are based upon, I will say that we must be careful that we interpret correctly the lessons of the past—experience in the history of apple growing in our country and especially of the last 35 years. The lamp of experience is a safe guide if made to reflect the united wisdom of millions of people through hundreds of years.

IN WINONA COUNTY.

We will now review the history of apple growing in our State. In the fall of 1851, John Shaw, of Exeter, Maine, gathered by the aid of his neighbors from ten to twelve quarts of apple seed. He arrived at Minnesota City in the spring of 1852, and after having selected a piece of land prepared a piece of ground in the timber for his apple seeds. He only lived to see the seed come up, and his dying request was that the trees should be divided among the members of the colonial association to which he belonged. This was done; enough to plant a large orchard being kept by the widow. All the farms in the neighborhood had enough for a good orchard, when the seedlings had attained sufficient size. Here is the first record I can find of the beginning of apple growing in the best fruit district in our State. It is recorded of this lot of trees that their product in one year was between five and six thousand bushels.

In the fall of 1871, traveling as a member of the committee *Ad Interum* for this Society, I visited the original orchard of the widow of Mr. Shaw and found about three hundred trees in heavy bearing, bringing in a handsome income. I think it was in that year that it bore 600 bushels. I am told that some of the trees were very productive up to 1884-5. Taking it for granted they began to bear when seven years old, we find they were in bearing twenty-five years. Is there anything discouraging about that? Now let us investigate the ancestry of the seeds from which these trees sprung. In an article by Henry Little of Maine, written in 1853, we find among one hundred and forty varieties mentioned the apples grown there were largely Sops of Wine, Maiden's Blush, Gravenstein, Hubbardstons, Nonsuch, Rhode Island Greening, William's Favorite, Ribston, Pippin and Baldwin. He says the Duchess was first brought there in 1847; it is very unlikely that its seeds were among those secured by Mr. Shaw.

If such results as those above mentioned can be produced by the use of such ill-adapted means, what may we not expect from seedlings grown from our own hardiest of all acclimatized apples, the Duchess de Oldenburg?

In the fall of 1871, as before mentioned, I visited many orchards in Winona county, which were of the best grafted varieties, set from 1856 to 1860. In numerous instances I found trees bearing twelve to fifteen bushels on a tree. Among the many I will mention those of our old friend and co-worker Hon. Norman Buck, who raised that year nearly 300 bushels; Hon. C. F. Buck, 200 bushels; G. W. Clark,

250 bushels; Orion Clark, 200 bushels; Mrs. Mary A. Campbell (formerly Mrs. Shaw), 600 bushels; M. K. Drew, 300 bushels; S. Bates, 300 bushels; W. R. Stewart, 400 bushels; L. Thomas, 600 bushels. These were mostly tender Eastern varieties. In one orchard I saw five trees from which the owner told me he had gathered one crop of 100 bushels, worth \$150.00. A good record for a climate where we "can't raise apples." These trees were alive and bearing in 1873.

IN HOUSTON COUNTY.

I visited the same fall several orchards in Houston county, and the great quantity of fruit on the trees astonished me. In the orchard of our friend Harris I was shown two trees from which one crop sold for \$44. They were St. Lawrence. His Talman Sweets were bending under an enormous load of apples. A few trees of that variety gave him 40 barrels that year and over 200 bushels the year following, that being the ninth year in bearing. Here also I saw that grand apple (but very tender tree) Jersey Sweet in bearing, and many others too tender for other portions of the State. Price's Sweet, only six years planted, bore two barrels to a tree. Is there any other portion of the United States that could do as well? He raised twenty barrels of Northern Spy in 1872. In our section the Spy has never blossomed.

Now let us reason together. If the same causes that killed this orchard for Mr. Harris also killed trees down in Central Illinois, Indiana and Ohio, why is it not reasonable to conclude that that portion of our State is as valuable for growing apples as the the other states mentioned?

In 1867 I traveled on foot all over Houston county once and a large part of it twice, and have been there a good many times since up to 1876, and I state now what was my opinion when I was among the orchards there in 1876: that if all the good orchard sites on a strip ten miles wide from the mouth of the Zumbro river to the Iowa line, in the eastern part of Winona and Houston counties, were devoted to apple growing in a businesslike way, the people of our State would have no need to send outside of our borders for apples.

The orchard of Mr. Harris was indeed a wonder for a State like ours, where but a few short years ago Mr. Lo held undisputed sway. Let us figure the sum realized from his Talman Sweet and St. Lawrence. They began to bear well about 1864 and bore their last crop in 1884. The two trees of St. Lawrence paid him about \$200 net, besides the fruit used from them in his family; they were in bearing each alter

nate year for sixteen years. We can plant ninety trees to the acre, the trees standing about twenty-four feet apart each way. At that rate the crop of each acre would be worth \$1,125. Talman Sweet also began to bear in 1864 and bore full crops each alternate year up to 1884, some of the trees being still alive. Mr. Harris thinks 1,000 bushels a low estimate of the total yield. These sold for about \$1,200, or \$120 a year for each bearing year, or an average of \$6 per tree. At that rate an acre would produce \$540 each bearing year, or \$270 per acre for the whole time.

THE "ORANGE BELT."

In these times of pension vetoes, chintz bugs, sixty cents a bushel for wheat, no more free passes on railroads, and the tariff likely to be taken from wool, are not St. Lawrence, that pay over \$500 a year, and Talman Sweets, that pay \$270 per acre a year, as good as anything we can go into, provided we live in Houston or Winona county—the orange belt of our State?

Another small tract at Reeds Landing and along Lake Pepin is also favorable for fruit growing. Here there is always or nearly so open water. Pear trees bore three bushels on a tree at Reeds Landing in 1867, and the crop from two trees sold for \$100.

Let us now leave the "orange belt" and go back north and west where the fierce winds coming from the treeless, arid plains of the bleak Northwest, destitute of moisture, blow scorching and withering in summer,—pitiless and enervating to all vegetable or arboreal life in autumn, winter and spring. Here we find apples also, but less varieties; the hardiest list from the orange belt lived in many places up to 1873, but the quantity of fruit produced, except in a few instances, was not sufficient to give much encouragement to the planter. Many varieties which seemed hardy in tree up to 1873 did not seem to form hardy fruit buds. The one notable exception being the Duchess of Oldenburg. A few other varieties were more or less fruitful in very favorable seasons. This great district has localities in it more favorable than others. Such as can be found along the Mississippi river, extending back in places thirty or forty miles; and also along the southern tier of counties west from Albert Lea to the State line. In this district not only do the Wealthy and Duchess look better than in a large part of the State, but there are some old Golden Russets to be found and a good many seedlings planted as long ago as 1863, are still in fair condition. This region extending to Blue Earth county on

the northeast and up to the high land north of Lu Verne, is of somewhat different formation and climate. It is in fact influenced more by the Missouri than the Mississippi valley. The Ben Davis stood very well in 1884-5 at Sioux Falls, right at the west end of this district.

I am led to this view of the matter also by the further fact of so many old seedlings standing so well all through this region, while in the counties northeast, such as Rice, Le Sueur, Scott and others, the seedlings were nearly all killed in 1872, and the remainder, with but one exception, completely annihilated in 1884-85; the one exception being the orchard in which the Peerless stands. That southwest portion of the State, together with the river portions above mentioned, not included in the first district, we can call district No. 2, and reasonably expect it to produce apples that cannot be grown in the larger portion of the State.

Over the rest of the State south of the forty-fifth parallel, and in some localities above that, the Duchess, or anything equally hardy, can be grown with great success by any one who will inform himself how to plant and care for trees, and then give them the same business-like care and attention that insures success in any honorable pursuit in life.

IN RICE COUNTY.

In the fall of 1855 Franklin Kelly brought with him a lot of apple seeds from New Hampshire and planted them on new land that fall. They began to bear in 1863 and bore well ten years, bearing a single season 150 bushels. The total crop in the ten years was 800 bushels; it was on a southern slope on the prairie near the city of Northfield. No grafted varieties except the Duchess have done as well under similar conditions, and it killed out in 1872-3. The seeds came from a section where they raised nearly the same list they did in Maine; such as Early Harvest, Grauenstein, Astrachan, William's Favorite, Spitzenberg, Baldwin, etc. From such ancestry we could hardly have expected more.

In our locality are to be found good Duchess trees that have stood twenty-five years and are still very productive. We have seven trees of Duchess set in spring of 1867. I believe they are good for twenty years more. They stood so close together they could not bear well. I cut out a number of them last spring. We never lose any Duchess, although we have lost nearly all the Wealthy and hundreds of trees of

other varieties. We now have about four hundred Duchess in orchard, and last spring set about five hundred more. Duchess will become still hardier if we propagate from our best and healthiest bearing trees, and it may be deteriorate by being propagated from feeble young trees. It needs a plentiful supply of moisture in the soil. The most of those that have died in Minnesota have become enfeebled either from lack of moisture to enable them to make a perfect and healthy growth, sunscalding of the body when exposed to the winter sun before the bark had become rough, or from being left in the fall with a clean, cultivated surface around the roots. Duchess needs a low, large, spreading top on the south and southwest sides. With such a top, soil reasonably moist and the roots protected with a thin mulch in the fall, it will not be injured. As long ago as 1872 our friend Harris put himself on record saying apple trees will grow any place where water stands within two feet of the surface.

The unusually wet fall of 1886 taught me a valuable lesson on soils and conditions of soils for apple trees. The latter part of September and first half of October was extremely wet. I then had one hundred and twelve seven-year-old Duchess on some very moist timber land. I said to myself those trees will show a yellow, sickly leaf next summer and undoubtedly will die from a wet root. The summer found them with a fair crop of fruit and a vigorous, healthy leaf and growth, and notwithstanding the ground was so wet in April and May, 1886, that we could not get onto a part of it till very late, they bore a fine crop of fruit, and are now models of health and vigor. They stand on a western slope with ground descending gradually to the south and west for a mile.

The past two summers I have seen *thousands* of good, healthy bearing Duchess trees scattered through all of the following counties: Rice, Steele, Faribault, Waseca, Le Sueur, Redwood, Lincoln, Lyon, Sibley, McLeod, Scott, Dakota, Carver, Ramsey and Goodhue. I am firmly of the opinion that before the close of this century we may reasonably expect to supply our own market for apples of its character with our own productions. In the summer of 1886 Duchess apples were so plentiful in our market that they sold as low as fifty cents a bushel for a few days, and some were sent to other points. The trees are now being planted largely.

FALL AND WINTER APPLES.

As we have now been informed where our summer apples are to come from, where shall we look for our fall and winter apples. I an-

swer, we must look to the seedlings of the Duchess of Oldenburg. Why? Because its trial of thirty years in the unfavorable localities of this State prove it to be more nearly perfect in its adaptation to the requirements of our rigorous climate than any and all other varieties.

Among the very first large orchards planted in the State was that of the late George Dorrance, of Rice county. This orchard consisted of several hundred trees set about 1857, as I am informed by the oldest settlers. The varieties seemed to include almost the whole list of popular Eastern sorts — among them the Pippins, Seeknofurther, Wine Sap, Fameuse, Swaar, Talman Sweet, Golden Russet, and, fortunately for us and the future citizens of the Northwest, there were of those that lived to bear six Duchess. The site of this orchard is in the town of Walcot, Rice county, in the extreme eastern edge of the Big Woods. It consists of a bench and hillside on the east, the top of the bench being about forty or fifty feet higher than the meadow or slough land east of it. In an early day there was timber about sixty rods west of the orchard. The soil is a marl or clay — a soil on which the Duchess does not live as long as on a rich alluvial soil on clay subsoil. In 1867 sixty-four trees bore thirty bushels of fruit. In 1867 the Duchess bore very heavy crops, and a large number of the other varieties were in bearing that year. From this crop of Duchess apples G. J. Miller, a neighbor and relative of Mr. Dorrance, living on the prairie two and half miles distant, sowed and planted a large lot of seeds and raised more than two hundred trees. I saw the trees in 1875, several of them bearing well; six of them are still alive and bid fair to live for years. Many of those that died in 1884-5 bore a great many large crops of fruit, and proved to be profitable. Of those still alive, one of them named "Itasca" has always, from 1875 to 1886 inclusive, borne enormous crops of apples. In size and color about like Rawles Jannet. In flavor rather poor, but somewhat better than the hardiest of the new Russians. Its season is October and November. In productiveness the Itasca is the equal of any tree of its size I have seen in the State.

Another tree is almost a reproduction of the Duchess, and about ten days later. Two others are worthy of mention, but I omit them. The best of the lot is the Peerless, which by a vote of this Society last winter was pronounced the best seedling apple known. I bring the Peerless up, and offer its achievements in evidence, to prove my claim that as the parent of a class of apple trees perfect in their adaptation to the wants and requirements of our climate the Duchess has no equal.

It must be remembered that these seedlings are in an unfavorable

locality. They are out on the broad prairie, remote from water, and one hundred miles northwest of the best fruit-growing part of the State; the soil a black prairie loam. Here the Wealthy trees were all killed in 1884-5, and out of thirty Duchess trees planted the same spring with the apple seed (1868), and a good many planted since, only four or five trees now remain. Now, all of these seedlings being later in season than Duchess, the Peerless keeping in good condition till February, is it not reasonable to conclude that by a proper system of selection trees may be produced that will bear apples of long-keeping qualities?

I have now planted in orchard about seventy-five trees of selected Duchess seedlings. I undertook to begin this business in 1873, after the previous winter had swept away nearly everything in my locality except the Duchess. That summer I had seen in the orchard of our friend Norman Buck, at Winona, two good bearing trees standing apart from the rest of the orchard; one was the Rawles Jannet, and the other was Duchess. It occurred to me that here would be a good chance to get a cross combining the ironclad constitution of one parent with the flavor and keeping qualities of the other; but the Duchess blooms earlier than the other, so, to obviate that difficulty, I made arrangements with Mr. Buck to mulch the Duchess well on the snow, so as to retard its blooming to correspond with the Jannet. I was then to have the crop of Duchess apple seeds, for which I was to pay him \$10. He did the mulching, but the hens went up, either while he slept or at some other time, and scratched it away, and our experiment failed.

NEW RUSSIANS.

My attention was then diverted to New Russian apples, and for awhile expected great things by a shorter cut than seedling apples, not knowing that we were simply repeating an experiment that had been tried in Europe before I was born, repeated in this country in the first half of the present century, and that as the result of those trials the Duchess had been handed down to us as the best of all.

Outside of professional nurserymen it is hard to find a single tree of New Russian apples, although hundreds of thousands of them have been sold and planted since 1873 up to 1884. So general was their destruction that out of three hundred and thirty varieties sold our friend Pearce offered to give \$5 each for every tree that could be found alive in 1886. In my section some of them live, but don't bear fruit. I have a tree fourteen years old on which I have never seen but one

poor little apple. I have a sample of the wood. You will see this wood looks all right. I have several varieties but little better so far as productiveness is concerned. My observations have not been confined to my own grounds or locality. I have traveled extensively, and with my eyes open. Surely, our experience has been great enough and costly enough to decide us against a further trial of New Russians.

Of the origin of the Duchess we are not told. In 1882, when Prof. Budd was at Kazan, on the Volga, he wrote that he had doubts about its being a full-blood Russian, although he saw a large list of its type. It seems to me that he was at those northeast points too late in the season. It may be that if he did see the trees, he did not recognize them under their changed condition. Kazan is about five hundred miles east of Moscow, and half way between the Caspian sea and the Arctic ocean; eleven degrees north of St. Paul, and nearly at the extreme northern limit of apple-growing in that direction. But, irrespective of its origin, it has proved to be the most valuable tree known on this or any other continent for us to raise a race of acclimatized seedling trees from. In 1882 that old Western pomologist, F. R. Phoenix, wrote for this Society an essay of about 6,000 words on "Hardy Apples From Seed." The article was ably written throughout, but the gist of it, as applied to us, was: "Raise your apple trees from seeds of Duchess." His views were warmly indorsed by Harris, Dartt and Gibbs.

About twenty years ago Col. D. A. Robertson, at that day the most eminent authority in the State, advised me to go to raising seedlings from Duchess, and, although we have had the world, the flesh and the New Russian apples to contend with, we have made some advance.

Our friend Harris has often advised us to raise seedlings. Our president in his last annual address said: "Should we not rather seek for hardy varieties among our own native seedlings?"

That great and good man, pre-eminent in pomology, the late Marshall P. Wilder, writing upon this subject, said: "The immense loss to American cultivators from the importation of foreign varieties * * * suggests the importance of raising from seed native sorts, which in most instances possess peculiar advantages. I am confirmed in the opinion that the best means of producing new and excellent varieties suited either to general cultivation or to particular localities, is to plant the most mature and perfect seeds of the most hardy, vigorous and valuable sorts, on the general pathological principle that like produces like. The skillful agriculturist saves the best seed of his various crops and selects the best animals from his herds for breeders.

Why should not this law of reproduction regulate the practice of the pomologist as well as of the farmer? * * * Our object is not to controvert the opinions of those who believe in the running out of varieties * * * but to enforce the importance of raising new varieties from seed."

Fellow members, the lessons of the late war taught us that fearful repulses like Cold Harbor and Chicamauga will precede final victory. We have *met* our Cold Harbor and Chicamauga, but athwart the darkness of defeat, to those of us who with faces toward the foes which have confronted us, the star of hope shines brightly and victory is just ahead.

"No waters can swallow the ship where lies
The Master of ocean and earth and sky."

All we need now is faith and perseverance. The prospects to my mind have never been so bright as they are now. If we read aright the lessons of the past and are guided by their teachings there will be no more failure, and the pomology of our State will be placed fully abreast of the advanced progress of the age.

Mr. Brand also placed on file the following correspondence:

LETTER FROM NORTHFIELD.

NORTHFIELD, Jan. 10, 1888.

O. F. Brand, Esq.

DEAR SIR: Your card of December 29th is received, asking for the history of my old seedling orchard. The seeds were brought from New Hampshire by my father, Franklin Kelley, in 1855 and planted that fall on land broken in the spring. The trees grew vigorously and commenced bearing in 1863, and continued to bear until we got as many as one hundred and fifty bushels in '69, and as many two or three years following.

One year I exhibited fifty varieties at the Hennepin county fair at Minneapolis and received a premium of \$10. The same fall I took the premium for cider, of which I made several barrels. I had the honor of making the first barrel of cider in Rice county, which was exhibited at the Rice county fair in 1866, I think.

My orchard continued to do well, with the loss of an occasional tree, up to the winter of— You know, when they got such a scorching that every one has since given up the ghost. I had commenced to propagate some of the best varieties, and had out about a thousand

root grafts which shared the fate of the old orchard. Although I was a member of the State Horticultural Society in those days, and attended the annual meetings with a view to "acquiring knowledge," I never found out what killed that orchard, and why I am obliged to pay my grocer twenty-five dollars every fall for a winter supply of wormy Michigan or Missouri apples.

A few of those trees were heavily mulched that fall—so much so that the ground did not freeze, others were exposed, while still others were banked with snow into the very branches a greater part of the winter.

A few varieties were superior in texture and flavor to any fruit I ever tasted from other states. Three or four varieties, although not properly winter apples, would keep till April or May.

If I have not covered the whole ground, shall be pleased to answer any questions desired.

Yours truly,

D. F. KELLEY.

NEW RUSSIANS.

FARIBAULT, MINN., Jan. 4, 1888.

Friend Somerville,

Will you kindly inform me—

1. How many trees of New Russian apples have you in profitable bearing?
2. How many bushels have you ever gathered from a single tree in one year? Name of best bearing sort?
3. How long have trees been planted?
4. How old were they when planted? Names of six best sorts in order of productiveness?
5. How many bushels have you ever gathered in a year of New Russians?
6. What is your soil and slope?
7. Are there any valleys near your orchard? How near, on which side, and how deep and wide are they?
8. Are you protected by timber? How much, and in what shape?
9. Is there water near the surface? How deep is your well?
10. Did you ever raise the Talman Sweet there, and about what year did they bear their last crop of apples?

In the interest of pomology an early reply, with the return of these sheets, will greatly oblige me.

Yours truly,

O. F. BRAND.

REPLY.

VIOLA, Jan. 9, 1888.

Friend Brand,

I will try and answer your questions as near as possible:

1. Twenty or twenty-five of the New Russians.
 2. I cannot answer that question very correctly, but one tree last fall, I think, had six bushels of apples.
 3. Nine years this spring, those in profitable bearing; but I have planted some each spring since. I think I have fifty or sixty varieties in my orchard.
 4. Three and four years. The largest apple I raise is the Charlamoff; the best bearer is the Antonovka and Red Streaked; the prettiest apple is one I cannot name, nor could Prof. Budd. Mr. Sias calls it the Wax Transparent; a biennial bearer. Then I have the Winter Oporto. I have a yellow apple; its name I do not know, but a good bearer; fruit fair. I have Red, Yellow and Sweet Anis; trees young and shy bearers.
 5. I do not know correctly, but in 1886 I think I had twenty-five or thirty bushels.
 6. Hazel brush or clay soil.
 7. Yes; a spring branch on the north near the orchard; timber on the west; valley narrow.
 8. Yes; on the west natural timber; north, willows and burr oaks; east, willows; south, Norway spruce. All around the orchards are rows of evergreens, and some scattering trees in the orchard.
 9. The spring branch runs water the year round. The well water comes in at a depth of thirty feet.
 10. I have raised Talman Sweet apples, Fameuse, Golden Russet, Ben Davis, and a number of other varieties. The last crop of Talman Sweet, Golden Russet and Snow apples was raised in 1883.
- My orchard is on a northern slope; clay subsoil. I pasture it with hogs in the summer, and mulch heavy each other year. By so doing the hogs and mulch keep the grass from the trees. Twenty-nine years ago I set out fifty Duchess trees. I cultivated for three years, then seeded down and pastured with hogs. I have that number of trees yet, all sound and right, and get over two hundred bushels of apples per year.

While I have great faith in some of the New Russians, I have some varieties that bear the poorest apples I ever tasted.

Yours,

WM. SOMERVILLE.

DISCUSSION.

Mr. Fuller. Mr. Chairman, I don't know that I ought to say a word in regard to this, but I have thought several times when I have been hearing these things that if a lot of boys were in here they would say "chestnuts." Sixteen years ago, when I first attended the meetings of this Society, our tables were filled with perhaps thirty varieties of apples, and we had a number of seedlings of the finest quality; and the same things precisely that were said in this essay were said then; and it was reiterated again and again that we must raise our seedlings from our hardy apples. Any of the old members of the Society know very well that we have been running down hill ever since then, as far as large apples are concerned; we have less seedlings to-day than we had sixteen years ago; we have less apples. I don't speak of this discouragingly; I always answer when people say "Are we ever going to raise apples in Minnesota?" by saying "I hope so;" I feel like still trying. But it seems to me entirely useless to reiterate, again and again, these theories, unless we can show some results for them.

Now, a year ago last fall we had some splendid seedlings at our State Fair, and I don't know when I have seen them excelled. But a few days afterwards Mr. Sias and myself went down to see the trees. Well, it shows the difference, perhaps, between Mr. Sias and myself; I may be disposed to be over-critical and to look for the faults in a thing; but as Mr. Sias would open his eyes so widely at those "splendid apples," I said, "Mr. Sias, look down here, that tree is dead." And there it was, rotten all through the sides and half the limbs; the tree was already killed.

So with all these seedlings; this Peerless seedling may accomplish something, but if it has been growing so long as Mr. Brand states, why haven't we some results from them? Let us graft it and see what it will do under other conditions, and before we reiterate it again let us have the results.

Now, there is our friend Gideon out here, who talks so hopefully; his Wealthy apple is failing. And I don't know to-day—except in our favorable points in our State—of a single apple that will stand; I know it is so at least in our section of the State. I believe in telling the truth about these things, and not deceive ourselves or deceive others with these grand platitudes that mean nothing. I believe in experimenting with these things hopefully, and doing the best we can and not saying much about it until we get a few results. [Applause.]

Mr. Pearce said he believed in the principle illustrated by the story

of the preacher who delivered the same sermon repeatedly—to continue preaching the same sermon until he got the people to “act.” The planting of seedlings had been advocated for thirty years, and when the advice was heeded they would then have fruit.

Mr. Sias said as Mr. Fuller was a Bible student, he wished to call attention to the fact that a tree is known by its fruit. The tree alluded to was Hart No. 1. On the occasion referred to the ground was almost completely covered with large, fine fruit, larger than the Baldwin or Ben Davis, and resembling the latter, and the tree was very well loaded. It was closely environed with willows and wild plums, and showed injury from blight, but was living to the very tip buds. If such fruit could be raised only on “dead trees,” he favored planting that kind. This tree had been very productive and began to bear when seven years old.

Mr. Fuller said Mr. Brand had fallen into the error of judging the good or bad character of a tree not from its hardiness but its fruit.

Mr. Harris said he had seen the Hart seedling before the last hard winter and found it injured on one side from rabbits, a plow, or some other cause, which was sufficient to destroy the Duchess or anything else. He did not consider it as hardy as some other seedlings, but had found sound wood upon it on examination after the recent hard winter, and it was somewhat hardier than Wealthy.

He could not agree with Mr. Brand that Duchess was the only Russian variety that was hardy; from the great number of varieties discovered by Prof. Budd and Mr. Gibb several could be named that were hardier. Hibernial, with Mr. Tuttle of Baraboo, was the finest of all in his orchard; the tops come out and make a beautiful tree, and he has two trees without a blemish; it is bearing well and the season is December. It is hardier and may be better to propagate from than Duchess. By growing seedlings we may hope to develop a pomology that will produce the finest fruits on the continent. The time is coming when Minnesota will have an abundance of fruit of her own, and some to supply Eastern markets. Let us test these Russians, for there may be many valuable varieties among them. He had tried over three hundred varieties to ascertain if there were any of the old varieties that were hardy. He made more money from Talman Sweet than any other one variety, but many never paid first cost of the trees.

We have had something unusual in our winters the past three or four years. The first injury to trees the season of 1884-5 was about the sixteenth of November. Mr. Lord, of Minnesota City, called at-

tention to that fact, and we examined a lot of trees and found two-thirds of them injured before there was any frost in the ground. In February and March there was a number of summer-like days when the sap came up and the thermometer again ran down suddenly to zero point, causing a further injury to trees.

Mr. Smith. Have you ever known a similar combination of circumstances before?

Mr. Harris. No. And I wanted to mention the wholesale slaughter of trees in 1872-3, when the cause of injury was root-killing. That winter Duchess and other hardy Russians on their own roots were injured more badly than native varieties.

Mr. Thompson. Mr. President and Fellow Horticulturists: I have come up here to try and learn something, but I find that your Society or the most of its members are different from ours. We should benefit by the exchange of ideas and from each other's experience. In the first place, our friend over there and several others, seem to be of the opinion that if they don't see and feel and know, and have it right in their hand, they won't believe anything. The only way to do is as the schoolmaster did with those who didn't believe in the North Pole—pound it into their heads some way or other. I am a seedling man; and here I want to quote a few sentences from the report of the pomologist, Mr. Van Deman, and from Dr. Hoskins, of Vermont.

Speaking of his visit to Arkansas Mr. Van Deman says: "One thing that interested me particularly was the large number of seedling apples of high quality; I think fully fifty varieties were shown that were entirely new. Some of these are worthy of further trial by experimenters, and a very few are described and illustrated in this report, as well as some already somewhat known."

To save time I want to read further and let you know that you have the best apple in the whole catalogue, originated right here by your own door-step. You say prove it; well, I read from what Dr. Hoskins says, along towards the last of this same report.

"But the future leading winter market apple of the cold North must surpass Scott's Winter in size and in dessert quality, and I am anxiously looking to Mr. Gideon's extensive orchards, produced under his system of crossing, for the desired apple. He has already announced a seedling of the Wealthy almost duplicating its other qualities, with a longer season, which he calls the 'Peter;' and I believe he, or some other Northwestern experimenter, proceeding on the same principle, will soon give us a Northern equal (or superior) to the Baldwin. This is alone needed to give the cold North the lead in orcharding, for it is

a well ascertained fact that the long days of our Northern summers are in the highest degree favorable to that combination of high color, delicate texture and fine aroma which sells an apple in the markets of the world. Already the Wealthy is being shipped to England from Canada with profit, and a long keeping Wealthy is all that is now required to become the leading commercial apple of America."

You want something better! Why don't you use what you have, farmers? [Laughter.] And in addition to that try experiments, every one of you. Plant the seeds of every good apple that comes in your way; save the good and discard the unworthy. If we are to produce good apples we must originate them from a combination of native seedlings and New Russians, to supply every quarter section with orchards, in Minnesota and Wisconsin.

Mr. Dartt. I don't know as I would say a word on this question only for a sort of fellow feeling I have for my brother delegate from Iowa.

Mr. Thompson. Be a little careful you don't get me into such a scrape as you did when we roomed together at Dubuque. [Laughter.]

Mr. Dartt. I would say that I have hopes with Mr. Harris of getting hardy varieties of apples, but I don't believe in these theories that we have them now. It is easy to take the ground of our friend Pearce; on the theory perhaps that a lie well stuck to is as good as the truth. [Laughter.] If this theory will win I have no doubt we will have lots of apples in Minnesota. That may be so, and perhaps I had better not say anything more.

Mr. Sias. Mr. President, I desire to say just a word of [this paper of Mr. Brand's. I notice that he gave us some valuable statistics in the first part of it. In the last part there was something objectionable, to the effect that we have nothing from the old country but Duch-ess that are valuable. Let us look at that point a moment; doesn't it seem a little singular that we have imported five hundred varieties from Russia and that this is the only one among the number of merit?

Mr. Thompson. There are over 1,700 I think in Prof. Budd's list.

Mr. Sias. Yes; it seems to me very improbable that Duchess is the only valuable variety. It reminds me of the Know Nothings who wanted to put none but American born citizens on guard—a very grave mistake, indeed! We admit Duchess is of foreign birth, and it stands at the head of the list. The cut-leaf weeping birch stands at the head of the list of ornamental trees; and for general cultivation there is nothing better than the Norway spruce. We must not be too selfish, and we do not want to go from this convention leaving the

impression as the sense of this meeting that there in nothing among those 1,700 varieties that is good for anything. Let us test them a little further. We have many varieties hardier than the Duchess and there is no doubt about it. This discussion would appear much better in Southern Iowa, Illinois or Kentucky.

Mr. Dartt. If we have found but one valuable apple in over 1,700 does that class them in a very favorable light before the people?

Mr. Sias. I do not admit we have found but one good variety among that number.

Mr. Harris. I contend that they haven't had a fair show.

President Elliot. I have been very much amused to see how this paper has stirred up the animals, especially the Russians, this great Northern Bear. Brother Fuller asks the question why we are always tinkering at this seedling question. We have got to keep this thing before the people, or we shouldn't accomplish anything. Out of a great deal of brush we may find something of value. We are going to get something, and in this method, if no other, I hope we shall keep trying, and if we don't secure the object sought for this year perhaps we will in the next one. When we look at the vast territory of Russia and see how they have succeeded it should give us hope that we may be fully successful.

Mr. Smith. Mr. Fuller makes a mistake in saying we have less apples now than we had sixteen years ago. I am not an enthusiast in regard to the general planting of apple trees, but I do believe Duchess is the best of anything we have for the people at present. We have to-day more than ten times the number of healthy fruit trees in Minnesota we had ten years ago.

Mr. Dartt. No, we haven't.

Mr. Smith. In the last three years there have been more good, clean fruit trees planted than at any other stage of our history.

Mr. Cutler. I think not.

Mr. Smith. Trees that went through the winter of 1883 and 4 will be worth something. If we continue to plant, as Mr. Harris says, we will soon have an abundance of fruit, for we may not experience such another winter in twenty-five years.

Mr. Dartt. It hits us about every other winter; we got it last year.

Mr. Smith. I have talked with farmers in all portions of the State and believe we are gaining ground. I saw more than a hundred Minnesota seedlings on exhibition at fairs last fall, and there are numerous trees to be found all over the State that bear fruit and do not show much, if any injury.

Mr. Thompson. If we only have faith we shall reap.

Mr. Dartt. Faith without works is dead.

Mr. Thompson. If it wasn't for faith we could accomplish but little. We are commanded to make use of the talent placed in our hands and we must do it if we are to make our farms pleasant, beautify the country and produce healthful food.

Reports were then called for from experimental stations.

EXPERIMENT STATION AT MINNESOTA CITY.

By O. M. Lord, Superintendent.

The season has not been favorable in experimenting with seeds, plants and trees at this station.

Some apple trees that were transplanted and set carefully at the usual depth perished with drouth. Others that were set at the least two feet deep, made a good growth

NATIVE PLUMS.

Of plum scions that were set in good season and with more than usual care, not more than one per cent grew; probably owing to a violent storm of rain, sleet and snow that immediately followed the fine weather when they were set.

A quantity of seed also failed to germinate that had been exposed to frost and planted in the usual manner. The ground has not been disturbed, and they may grow next spring, but a year's time has been lost.

Ten varieties of plums were received from the Iowa Agricultural College; two from Mr. Pond, of Kasson; two from Mr. Brand, of Faribault, and a few others from localities near by, which has increased the collection here to over thirty kinds. Some of these will prove to be valuable for general cultivation; and others, particularly the Chickisaws, will be abandoned; also *Prunus Simoni*.

I would like to call attention here to the remarks of "The Farmer" upon the statement of Mr. Harris, published last spring, in regard to the hardness of Chickisaw plums at this station. "The Farmer" assumed that the failure of one nursery to carry trees through the winter was no test of their adaptibility to this climate. Mr. Harris was acquainted with all the conditions, while "The Farmer" was not. I would say that this station is not a commercial nursery, and

could have no object in jumping at conclusions. And from the fact that we have heretofore grown in this vicinity grafted and seedling apples and other fruits that have not succeeded in other parts of the State, it is generally conceded that this location is most favorable for fruits not entirely hardy. Add to this the fact that the last few winters have not been considered test winters, and we conclude that when trees winter-kill to the ground here, they are not well adapted to general cultivation when exposed to greater risk.

SMALL FRUITS.

The protracted drouth materially interfered with some of the work in small fruits, and very little was accomplished. One row of Stone's Hardy blackberry was set next to a row of Ancient Briton for the purpose of comparison. Also a row of Cook's Windom Dewberry by the side of a row of Lucretia for the same purpose.

Of grapes Iona, Worden, Moore's Early, Empire State, Massasoit, Lindley and Wilder have been added to the list. The only strawberries set for trial are Crawford's No. 6 and the Jessie.

EXPERIMENTAL WORK.

In regard to the work of experiment stations a superintendent of one of the Iowa stations writes me there is a good deal of burlesque about some of them. Query: May the same criticism, or even a more definite one, be applied to ours? If our critic should base his remarks upon what we have not done, I fear he would have a wide field of labor. If, however, he should carefully consider the difficulties under which we labor, the subject would be placed in a different light. A very few of these difficulties may here be stated as an apology, or excuse, for light work and meager reports. So far as I am acquainted with the experimenters, not one can devote his whole time and attention to the work, and if he could, the results are always doubtful, and the money value thereof (to himself) more than doubtful. We have no organized means of obtaining seeds, plants and trees to experiment with, but have been wholly dependent, so far, on our own resources. We have had no clearly defined system of work, of instruction, nor advice; and the only intimation I have seen as to what is expected of us was in a late number of *The Farmer*. In noticing the call for the annual meeting, it said: "Above all, those present will expect to hear detailed reports of operations at the experiment stations."

In appointing these stations it was understood that the Society de-

sired fruits tested, as to their quality, adaptability and hardiness, and also desired the results to be made known generally for the benefit of those who would plant; but in looking for these reports it would be well to bear in mind that for most fruits a series of experiments, extending over several years, may be necessary to establish their value. If results are given by only one experimenter there is room for doubt whether a thing may succeed or fail when tried by another in a different locality, unless all the conditions are understood in making the tests. It is therefore suggested that the Society establish some system of uniformity of work among the stations, in pairs, or among a greater number, if a larger range is desired for any specialty

EXPERIMENTAL STATION AT ROCHESTER.

By A. W. Sias, Superintendent.

Mr. President and Gentlemen of the State Horticultural Society:

We have now sixteen experimental stations and are anxious for more providing there is another man in the State who is so heavily laden with love for the business that he is willing to "work for nothing and board himself," as Brother Dartt said in reference to extending the borders and increasing the laboring force of the Olmsted County Horticultural Society. In common warfare, volunteers make the best soldiers, while those who enlist for fame or money make the best thieves. Now in this battle for the "coming winter apple" and the amelioration of other fruits, we want superintendents that will work hard for the love they bear the cause, whether paid or not, and leave the responsibility for short comings and poor work at the door of the State legislature.

Our last report shows only seven superintendents heard from. What does this mean, unless it is that it takes money to make the mare go? The majority of these superintendents are men of limited means, and cannot be expected to put much time into experimental work without a reasonable compensation. O. M. Lord struck the "key note" when he made the suggestion that the superintendent at each station be given a specialty for which he was best adapted. For instance, give the superintendent at the State University farm a branch of work that requires the deepest scientific research; O. M. Lord the development of our native plums; Peter M. Gideon to continue the grand work left by Dr. Van Mons, whose "nurseries con-

tained in 1823 no less than 2,000 seedlings of merit ;" the superintendent at Rochester would like to ape Andrew Knight (on a very small scale, of course) and so obtain a cross between the McMahon White and the Autumn Streaked, also cross the Red Cheeked, Red Anis, Antonovka, White Pigeon and Russian Green with McMahon or some better keeper. In other words to make a specialty of hand fertilization. In this way let each superintendent choose a specialty for which he is best adapted. If this plausible scheme of Mr. Lord's could be carried out the whole Northwest would soon begin to see that our experimental stations were made to perform a grand work. C. G. Patten hit the nail square on the head when he remarked: "Gentlemen, we need a Van Mons and an Andrew Knight in every state of the Northwest."

The past extreme winter, and summer's drouth, admonish us of the necessity of clinging to the Russians. This and many other generations shall pass away before they go out of date. At least our experiments point to this conclusion.

Our experience is that the Brandywine raspberry is about what we want. It stands the summer's heat and winter's cold equal to the Turner; yields better with us, and is more attractive on the market. We think it has no peer as a keeper or shipper among red raspberries. Schaffer's Colossal is very large, but inferior to the Brandywine as a shipping berry.

The Jessie strawberry has only been with us one season, but looks very promising; but as we are never satisfied short of perfection, we propose to fruit a seedling from the Jessie as soon as possible. The Manchester was one of the very best with us this year. Old Ironclad, best of the early varieties.

The Windom dewberry behaves better than the Lucretia. Shell-bark hickory trees grown from seed raised on the grounds of J. S. Harris in Houston county, now two years old, are likely to stand the racket.

EVERGREENS.

The thirty varieties of evergreens on our experimental grounds, prove to us most conclusively that Minnesota, any part, is the genial clime and soil for evergreens. The Norway Maple and Sycamore have proven too tender. The Rocky mountain conifers from D. S. Grimes of Denver, Col., and from Robt. Douglas, of Waukegan, Ill., are doing finely.

The Rockford plum from C. G. Patten, is fine. Fay's currant is a

failure with us. The plants from Chas. Luedloff, Ostheim cherry, weeping willow from Europe, the new lilac, philadelphus, etc., are all doing nicely. We had a round bed of thirty or forty *Hydrangea paniculata grandiflora*'s all in bloom at one time that made a grand display.

EXPERIMENTAL STATION AT LA CRESCENT.

By J. S. Harris, Superintendent.

Mr. President and Fellow Members :

My report of the work of last year shall be very brief. I think I am making progress slowly.

The few varieties of Russian apple trees heretofore reported upon came through last winter all right. The variety I suppose to be Ostroff Glass, Antonovka, Orel and two or three varieties of the Anis, are making the most satisfactory growth. One tree of Anis, bore one specimen of medium size, green and red striped; quality excellent, ripe September 10th.

Have added to my list of Russian apples for trial; Yellow Transparent, Early Glass, Repka, Lords apple, Juicy Burr, Red Cheeked, Beautiful Arcad, Switzer and Vargil.

Plum trees bloomed freely but did not mature any fruit. I have added one variety of Russian plums.

Owing to the drouth and an attack of sickness when my trees needed most attention, some of them failed to live, and none of them have made a strong growth; so if they kill out this winter I shall not attribute it to the varieties, or blame the parties I procured them from. I have also added six trees, one year old, of Hotchkiss Seedling; all lived and doing well.

Russian pears did not kill out, but are not making a satisfactory growth. The same may be said of Salome apple. The celebrated Mann apple again killed to the ground and it is useless to try it longer. Have one tree of the Gideon apple; it did not winter kill but was bark burnt by the October freeze.

The Niagara grape is not doing well with me. It drops its foliage too early. Shall try it again with new plants.

I now have good facilities for conducting experimental work, and will promise to take charge of and give a fair trial to any new varieties of fruit sent to me and make impartial reports upon the same. Promising varieties of native plums are especially desired.

Thanks are due to O. M. Lord, Chas. Luedloff; Carver, Dewain Cook, and Joe Wood, Windom; S. D. Richardson, Winnebago City, and J. O. Barrett, Browns Valley, for favors received.

EXPERIMENTAL STATION AT FARIBAULT.

By O. F. Brand, Superintendent.

This station is on comparatively high timber land. The surface soil is a deep, rich, black loam, underlaid with a yellowish and blue, porous clay subsoil; soil naturally moist; exposed to west and south; protected by higher ground north and east; the valley of the Strait being less than a mile west and less than a mile south; the river being about 150 feet lower than our station.

Here we never have been able to raise a good tree or get fruit of any account from Fameuse, Perry Russet, Golden Russet, Haas, Red Astrachan, or Talman Sweet. Such early bearing sorts as Price's Sweet or Wealthy have borne one good crop as young trees and then died.

In 1877 we planted about one thousand two-year-old Wealthy which nearly all died in 1884. In 1875 we budded a large number of crab trees with Miller's seedlings of the Duchess; all of the crab trees on which we budded were killed with blight, except two Beaches Sweet; those two are fine, large trees and have borne fruit for nine or ten years. One of them is an apple a few days later than Duchess and not quite as large; less acid than the parent, but otherwise almost an exact reproduction of Duchess. An examination since the extreme cold of Jan. 21, 1888, (48° below zero), and also since the thaw which has taken place since the extreme cold, shows no perceptible injury to the wood. The original tree of this variety, now about twenty years old, is still in good condition and a heavy bearer. The other tree bears an apple very much like the Janet, and seems to be equally hardy. In quality it is third rate or about like Lieby or Hibernial, as known to us. The young trees of this variety are as hardy as Duchess. It forms a low, spreading top, similar to Lieby. We have one seedling about nine years old which bore a fair crop in 1886. The fruit is nearly as large as Fameuse, of fair quality, about a month later than Duchess; seems to be crab wood.

We also have a crab or Hybrid thirty-two years old, called the Berry, named after the originator, the late Hon. J. M. Berry of Minneapolis. The fruit is the size of Transcendent, about the same

season; handsome and better in quality. The tree is fifty-two inches in circumference and thirty feet across the top. It is a true ironclad.

We have one tree of Drake apple, top worked on a seedling crab. This tree bore more than a barrel of fine apples in 1886. The original Drake was a seedling near Northfield, grown from seed from New Hampshire about 1856 or 1857. It was dug out as worthless in 1873. Our live bearing Drake is the only one left of several fine top-grafted trees; and the reason why it is a good tree is because it is on a hardy stock, and has formed a low spreading, heavy top to the southwest, that shades the forks of the tree from the sun.

Of the Peerless apple last spring we used it to top-graft seven varieties of crab apples besides putting in a few hundred root grafts. All the top grafts made a good growth and we will be able to report upon it more fully after another season's growth.

RUSSIAN APPLES.

We received from the Department of Agriculture in the spring of 1873, sixty-five varieties of New Russian apples. Some of them I top-worked on bearing crab trees and the rest were stock-grafted close to the ground on four-year-old seedling crab trees. All of those top-grafted on bearing trees came into bearing but soon killed with blight. Some of them were on the Berry crab, above mentioned; not one was left in 1879. Of those grafted at the ground nearly all came into bearing but soon died—with blight or cold. Most of them bore fruit of a worthless character. Four trees are still alive, two of them bear a small crop of worthless apples. One bears a few very small, early apple, not so large as Transcendent; a very fair fruit for its size. The other is a very fine tree but bears only a small crop of fair-sized sweet apples. There were two fine trees of Longfield that bore a fair crop in 1882, but killed in 1884; were badly injured in 1883.

In the spring of 1883 we set out one hundred two-year-old trees received from Prof. Budd. There has not been a blossom on any one of them yet, and but few if any of them will stand this climate. At the present time they do not look as though they were adapted to this latitude.

Last spring we transplanted about seventy-five seedling Duchess into orchard rows. These trees were grown from seed saved from Duchess apples which were latest in ripening. Every tree made a good growth last season. A few months more time is necessary to enable us to see what effect 48° below zero has had on newly transplanted Duchess seedlings.

We have about thirty seedlings from Peerless, many of which show a good leaf, but they are only one year old; still it is possible that some one of them may become prominent in some future report. We have about forty good bearing trees of Tetofsky left, out of 150 grown from root grafts, set in 1870 and 1872. The greatest loss among them was in 1884. We have never lost any Duchess, and have seven trees that have been growing in our orchard twenty-one years.

We have used evergreens freely for protection and windbreaks, hundreds of which are more than thirty feet high. We strongly recommend the use of evergreens around every farm home. White Spruce, White Pine, White and Red Cedar, and on moist or clay soil the Balsam Fir. The Norway Spruce is not desirable in the windy prairie portion of the State. The Scotch Pine is valuable both for timber belts around fields and for fuel. We have learned that a dry round stick of Scotch Pine eight inches in diameter will keep fire in a heating stove longer than a stick of hard maple of the same size. That is something worth knowing.

EXPERIMENT STATION AT LITCHFIELD.

By G. W. Fuller, Superintendent.

The Russian apple trees obtained from Prof. Budd in 1885 have all failed. Of the trees obtained in 1886, the cherries and pears all died or were killed to the snow line. A few varieties have done fairly well, the Hiberna I think doing the best.

The Red and Yellow willows and some of the poplars promise very well. I cannot but doubt that we shall obtain from them some valuable additions to our forest timber.

REPORT ON FRUIT.

Our crop of apples was very small, only a few Transcendents; and these were mostly grown on a few orchards in the timber. The few raspberry bushes we have bore exceedingly well, especially where the canes were buried. Gooseberries and currants bore less than quarter of a crop. The strawberry promised very finely in the early part of the season, but the dry weather diminished the crop very much; still our strawberry crop was the largest we ever had.

EXPERIMENT STATION AT CARVER.

By Chas. Luedloff, Superintendent.

With great pleasure I send my report of results in horticulture the past year. I begin with the apple as our leading fruit. I cannot say much about the fruit crop, because the old trees are all dead, as they are also in the surrounding neighborhood. Next spring I will re-plant, for a new beginning, with one and two-year old Russians.

The little Russians I experimented with last year suffered greatly from the effects of drifting snow, most of them being broken down. I had to cut them back, but most of them made a growth of four feet and over, in a very dry season, none of my trees blighting. There is a prospect of getting more durable trees from the Russian kinds than from Minnesota and Wisconsin seedlings, as the latter kinds do not ripen their wood early enough to enter the winter in good condition; most of my seedlings were lost on account of this.

It is evident that a seedling may flourish and bear well in its native place for many years, but when propagated and transplanted in a different soil and location, it may prove to be a failure.

All new seedlings recommended to us should first be tested at every experimental station, and we must also test the Russian in the same way. In this way we will reach the point we are seeking sooner, and find the hardiest kinds for general planting.

My plum crop was good, but the fruit was not as large or of as fine a flavor as in previous years. Most of my trees are the best of native and seedling varieties; besides these I have under culture the Weaver, De Sota, Newton Egg, Peach, Forest Garden, Miner; Wolf and Speer are new. My Russian plums not being quite as hardy, I cover them, as I wish to use them for crossing with the natives, and, if it is possible, to get a kind with firm flesh that will be good for drying.

The strawberry crop was poor; the first picking was middling; after this the berries were small and of a poor flavor, the plants were nearly dead on account of the drouth, but happily on the first of July we had a heavy rain, more following later, and before winter the plants were in a splendid condition, with a good prospect for a fine crop next year.

My grape crop was fine in quality and quantity, over thirty kinds bearing. The best are Barry, Rogers No. 43, Rogers No. 33, Brighton, Beauty of Minnesota, Eldorado, Worden, Rochester, Duchess, New Haven, Green's Extra Early and Martha. But it should be stated as

a fact that no one grape is suited to all localities; neither is there any one locality which is suited to all grapes; this must be determined by experiments.

The blackberry crop was short. Snyder was small and sour; Ancient Briton was much better.

ORNAMENTAL AND FOREST TREES.

Ornamental trees should be planted on a larger scale around dwellings, school houses, churches and in public parks, and thus beautify the country.

But we must not neglect the replanting of forest trees to take the place of our destroyed forests, and also the planting of new forests, that the climate may be healthy and productive. I give a list of the kinds I find to be adapted to our climate:

Acer campestre. A small, stocky tree, small, handsome foliage.

Acer Wier's lancineatum. Wier's cut leaved silver maple. It is a variety of the silver leaved; shoots tender and drooping; one of the best lawn trees.

Acer platanoides. Only hardy enough in shady places.

Acer atropurpureum. Cut leaved purple Japan maple; foliage dark purple and deeply cut; very ornamental; stood the last two winters very well.

Acer polymorphum atropurpureum. Blood leaved Japan maple, bushy shrub and dark purple, deeply cut leaves; very fine; stood the last two winters well.

Betula alba fastigata. Pyramidal birch of elegant pyramidal habit, like the Lombardy poplar.

Betula alba. European white birch of rapid and graceful growth, and having silvery bark; after the trees get to a moderate height the branches droop.

Betula pendula laciniata. Cut leaved weeping birch. One of the best of all weeping or pendulous trees, with finely dissected leaves and white bark.

Betula atropurpurea. Purple leaved birch, having purple foliage; stood two winters well.

Catalpa speciosa. Western Catalpa. Did well in sandy ground and timber.

Larix European. European Larch. An elegant, rapid, pyramidal tree; small branches drooping; should be more of them planted for timber.

Populus alba Calleana. Similar to the lombardy, with silvery cut leaves; very ornamental.

Populus Petroosky. *P. beroelensis*. *P. pyramidalis fastigata*. *P. pyramidalis Siberica*. *P. laurifolia*. *P. certinensis*. Fine ornamental and timber trees.

Populus monüifera Van Geerty. With yellow leaves.

Pyrus acuparia. European mountain ash; a fine tree, covered from midsummer till winter with great clusters of bright, scarlet berries.

Quercus bicolor. *Q. coccinea*. *Q. palustre*. *Q. prinus*. All do well in our climate.

Quercus pedunculata. From Europe; growth more rapid than our white oak; in wood it is just as good, and should be largely planted for timber.

Salix laurifolio. Laurel-leaved willow. A fine ornamental tree, with very large, shining leaves.

Salix rosmarinifolia. Rosemary-leaved willow; foliage silvery.

Salix purpuria pendula. For weeping it must be grafted on some stock five to seven feet high.

Salix regalis. Royal willow; a fine tree, silver foliage.

Salix fragilis. A rapid growing tree, for timber.

Salix Kapoleanis. A fine weeping when grafted on some stock.

CONIFERA AND EVERGREENS.

From the many kinds I have experimented with I find hardy for our climate as follows:

Abies Douglas, *Abies alba*, *Abies nigra*, *Picia concolor*, *Pinus cembra*, *Pinus massoniana*, *Pinus resinosa*, *Pinus munhus*, *Pinus ponderosa*, *Abies pungens*.

Juniper Sabina. *Sabin Juniper*. A dwarf spreading shrub, suitable for rock work.

Juniper tamariscifolia. For rock work.

Juniper squamata. Scaled juniper; fine for rock work.

Juniper Venusta. A rapid grower with fine, silvery foliage; very ornamental, the best of all.

Thuja burrowii. *Th. compacta*. *Th. Geo. Peabody*. *Th. globosa*. Little Gem. Tom Thumb. All of dwarf, compact growth.

Thuja Siberica. Siberian Arbor Vitæ. Is the best of all the genus of this country, keeping color in winter; grows compact.

Thaja pyramidalis. Douglas pyramidal arbor vitæ; pyramidal in form, foliage distinct, like a *Petinispora*.

Petinispora rurea. Beautiful golden-tipped foliage; needs a little protection.

THE CLIMATE OF MINNESOTA.

By Chas. Luedloff, Carver.

Has the climate of Minnesota changed since the first settlement?

Yes, since the virgin soil of Minnesota was first opened to agriculture and horticulture there has been a great change in the climate. Our water supply is gradually becoming less, in lakes, creeks and rivers. Our creeks formerly full are now dry most of the year; the water in lakes and rivers is slowly receding, the banks and the shores being broader and higher. The sloughs not ditched becoming dry, the wild grass dying, making it necessary to sow tame grass, so that we may have food for cattle. Our rivers formerly navigable almost to their sources, can now be navigated for short distances only, the low stage of water and snags stopping navigation or making it dangerous. This increasing dryness is dangerous to the interests of agriculture and horticulture as well as manufacturers.

Now a word about its effect on fruit culture. As examples of our first immigrants in the apple were Plumb Cider, Haas, Perry Russet, Golden Russet, etc. These all did well for a while then they died. After them the Lezion crab was tried, which did well for a time; then the blight destroyed them. Now we are sifting out the hardiest kinds of Russians and seedlings. Some of these are standing well but how long will they flourish in this dry climate?

What is the question? I will give you my opinion. The temperature of the climate is controlled by the moisture in the air; moist air breaks the extremes of heat and cold, as we can prove by referring to the coast section.

A person living where the air is very dry is subject to the extremes in temperature during night and day. In the dry air of the desert after sunset the temperature falls very quickly, until ice is often formed during the night. This proves that there is a lack of moisture in the air.

Now, let us look at the climate in a timber region. There the air contains more moisture. During every month of the year there is

more rain and dew. The timber breaks the wind—makes the summer cool and the winter warmer.

Everybody must admit that our timber is fast disappearing, and we must take care that we do not reach the point that some countries of Europe and Asia have. There the timber was ruined, the climate changed, the rainfall decreased, cereal products became less, and farm industry was at a stand. We should make application to our legislature and to Congress to pass laws to protect our timber and replant our forests. Then the time will come when our climate will be improved, and agriculture and horticulture will flourish.

REPORT FROM WINONA COUNTY.

By O. M. Lord, Minnesota City.

The yield of small fruits for the past season was considerably below the average owing to the drouth. Beginning with strawberries the quick sandy soils produced a fair crop of the early kinds, but very few of the late ones matured. The main market supply of Winona is produced upon clayey soils, which being naturally later produced a very light crop.

Red raspberries blossomed abundantly, but continued dry weather injured them beyond recovery. The kinds principally in the market were Turner and Cuthbert; the retail price was quite uniform at 15 cents. Blackcaps were shriveled in appearance and of poor quality.

Currants may be put down as an entire failure. Blackberries bid fair for a full crop in the early part of the season. The bushes were loaded with fruit which literally dried up on them without ripening.

Grapes were considered a fair crop, both in yield and quality. The market was at all times well supplied, and the prices lower than usual.

APPLES.

The Duchess in some few places produced fairly, sufficient to nearly supply the market, and different kinds of crab apples were abundant.

Wild plums were not offered for sale in plenty as usual. The trees in some localities did well, but from the failure of other fruit more than common were kept for home use. Prices ranged from one to two dollars per bushel, though the fruit was not of average quality.

What effect the excessive drouth may have on the next crop it is difficult to determine. Some predict a failure from the supposition

that the vitality was too much lowered to properly form fruit buds. Others hold that what vitality they possess is expended in the perfection of fruit buds, as the only means of perpetuating the species, and that we may confidently look for a fruitful season after an unusually dry one, if favorable weather supervenes.

REPORT FROM WINONA COUNTY.

By S. A. McHenry, St. Charles.

On account of extreme dry weather the strawberry crop was very light and quality poor. Windsor Chief, Parry, Crescent and James Vick were the leading varieties. Raspberries were a fair crop, good quality and generally sold at a paying price. Turner and Schaffer's Colossal were the best of the red varieties and the Taylor and Elmira best of the blackcaps.

Blackberries, where properly mulched, were a good crop, but where not mulched were somewhat injured by the drouth. Quality and price were generally fair.

Grapes were the best they have been for years. Moore's Early ripened first, but all varieties ripened before frost. Delaware and Concord were very heavily loaded.

Apples yielded well, but the quality was not as good as last year. The dealers here shipped 1,240 barrels the past season.

It is now generally admitted throughout this section of the country that small fruit can be successfully grown here. Most of those now in the business are enlarging their plantations, while many more are beginning. Windom dewberry is attracting considerable attention in this vicinity, and we are in hopes that it will prove of great value on account of its hardiness and productiveness.

REPORT FROM HENNEPIN COUNTY.

By M. Pearce, Minneapolis.

The past season was very dry. The grape crop here, comprising Concord, Worden, Delaware, Niagara, Brighton, Cottage, and Roger's Nos. 4, 15 and 29, together with several other varieties were very fine, ripening in good season and yielding abundantly.

All the raspberries that were protected during the winter and had

proper cultivation, also did well. The same is true of blackberries and strawberries. The Turner and Cuthbert were the best varieties of red raspberries, and the Gregg of the black varieties. Of the blackberries, Ancient Briton and Snyder; strawberries Wilson and Crescent; currants Red Dutch and Stewarts seedling.

APPLES AND CRABS.

Crop very light; blasted in the blossom. The trees made a good growth, but most of them were more or less injured by the previous winter. The wood of Wealthy, Duchess, and most of the Russian colored crabs and hybrids wintered well. About fifty seedlings of the Wealthy, three years old were not injured in the least.

NEW SEEDLINGS.

Victor, three years old, thirty trees, not injured in the least. This variety has fruited with us for six years. Fruit medium in size, striped, sub-acid, juicy; of the very best quality. Season, September and October. We have great faith in this variety. It is now on trial at various points in Minnesota and Dakota.

Unknown, a Russian variety ten years old, has never been injured. It is a rapid grower and an immense bearer; fruit as large as Wealthy and keeps as long; striped; a good second quality.

Tonka, a hybrid grown from a cherry crab; supposed to have been fertilized by Duchess. Fruit flat, red, larger than Transcendent, and ripens after that variety is gone. Very juicy; sub-acid, no crab quality; a prolific bearer, and never water-cored. Tree hardy; has never blighted. It is being tested at various stations. We expect good results from it.

We are satisfied from years of experience that it is useless to expect a full crop of good strawberries, raspberries, or blackberries without proper winter protection. During the last three years we have given all our plants winter protection, at a small cost, and the good results secured were far beyond our expectations. We are satisfied that the great problem of small fruit growing in Minnesota is solved.

REPORT FROM WASHINGTON COUNTY.

By M. C. Bunnell, Newport.

Mr. President, Ladies and Gentlemen :

Allow me to say that I have had but little time to prepare my report, and so you must not expect anything very elaborate. As to the

growing of fruit in Washington county, more especially standard apples, I find many among the farmers who are discouraged about re-planting where their trees were killed three years ago by the hard winter. They do not stop to think that the varieties they were accustomed to raising in Southern Wisconsin and Northern Illinois (even as far south as the central part of the latter state) were injured during the same months in those localities, and that, if one would keep his orchard up, so as to receive benefit from it, he must renew his trees occasionally. Perhaps if they would become members of our Society they would learn from the experiences of others, gain more courage and not be so disheartened about apple growing in Minnesota.

CAUSE OF FAILURE.

Too many trees are carelessly planted, put in narrow, contracted holes, and not enough fine earth worked in among the fibrous roots, thus setting them firm in the ground. Also, not mulching after planting, but leaving the trees to take care of themselves; the planter, however, hoping some day to pick and eat apples from his trees. But, alas! he will be doomed to disappointment. They perhaps never leaf out. What comes next? Why, of course, he condemns the tree peddlers, as they are termed; or, if he can't attach blame to them, he goes for the climate, and concludes that it is no use to bother with apples in Minnesota.

I know that tree agents, as a rule, have great notoriety wherever they travel; but still I think they are quite useful at times, to get around among the farmers and stir them up to the idea that some sorts of fruits ought to be mixed in with other products of their farm, and that they ought not be confined to vegetables and animal food altogether for a living. No one denies but that ripe fruit is healthy for anyone to eat, and promotive of the welfare and happiness of mankind. One old patron of mine, whom I was stopping over night with, says: "I presume I shouldn't have had an orchard if it hadn't been for the agent." The careful planter, loses his trees, some times, through the effects of climatic changes; but he is generally ready to give an order to an authorized agent of a good, responsible company for more, for the purpose of keeping up his orchard.

HOW TO PLANT.

As to the best method for purchasing and planting trees in Minne-

sota. In the first place patronize those agents who can show you a certificate from a responsible company, and give you honest information regarding the hardiest varieties, and most farmers do prefer to buy from one who can give them information as to varieties, planting and care of trees.

For apples, select a northern slope, if you can get it convenient to your buildings. Then obtain the Duchess and Wealthy with a sprinkling of hybrids, viz., Whitney's, Early Strawberry, Orange, Transcendent, and Hyslop. It might be well perhaps to try some of the New Russian varieties. Clay soil or a rocky soil is preferable to any other. Dig good sized holes, planting the trees two or three inches deeper than they were before being taken up out of the nursery. See that your earth is put in well around the fibrous roots and packed firmly. After planting mulch well and keep your stock away from the trees. Plant plums in groups, as they bear much better in clusters, selecting DeSota, Weaver and Forest Garden.

For grapes, select a south or southeast slope, fertilizing with a rich compost. Old bones are beneficial if put around the roots when planted. Plant six to eight feet apart. For trellis use posts with three wires. Prune and lay down in the fall about the first of November, and uncover about the first of May the following spring, putting them upon trellis. You will be amply rewarded for your time and expense.

SMALL FRUITS.

For raspberries select Gregg's Mammoth Cluster for black; Cuthbert, Turner and Philadelphia for red. Plant them in rows six feet apart and four feet between hills; cultivate well and keep suckers from spreading. Mulch well. Of the red, after they are through bearing, cut out all dead canes, leaving about half a dozen new canes in the hill to be laid down in the fall for winter protection. In the spring take them up cutting them back to $3\frac{1}{2}$ or 4 feet. I think if you adopt this plan you will be sure to get a good crop almost every year.

For strawberries select good soil and cultivate well the first year; putting the plants $3\frac{1}{2}$ feet between the rows and 18 inches to two feet in the row. Fertilize the pistillate varieties every third row with a staminate variety. Wilson, Crescent, Manchester, Chas. Downing, and Windsor Chief do well in Minnesota.

Currants, planted on good soil, can be raised very readily. Give them plenty of manure. Select such as Red Dutch, some Cherry,

White Grape, Black English, etc. For blackberries select Stone's Hardy and Ancient Briton.

In conclusion I will say that in Washington county I did not find many standard apples in bearing the last year, owing to the old trees being killed three winters ago, and those that have been replanted are not far enough advanced to bear yet. Transcendent and Hyslop bore some. One man by the name of Gilla, eight miles from St. Paul had some fifty bushels of Duchess, which he marketed at a good price in the city. I think the Whitney will give general satisfaction as more of them come into bearing. Quite a number of Early Strawberry are in bearing in different sections, which suit the tastes of most people. Some are commencing to plant the New Russian varieties.

The plum crop was a failure in this section, owing I think to the hail storm we had in April. Grapes were quite a profitable crop and bore in abundance where they were well cared for. Currants, raspberries and strawberries were all good crops, and commanded a pretty fair price.

I trust, as members of the State Horticultural Society, that our practical knowledge in fruit growing in Minnesota may be disseminated to others outside of our Society, which is calculated to make mankind healthy, wealthy and wise.

REPORT FROM CHIPPEWA COUNTY.

By O. E. Saunders, Granite Falls.

I have no very flattering report to give, as the fruit crop was very light. The causes that produced the failure, or partial failure, were such as are liable to occur in any country or climate. Just at the time when currants, gooseberries and plums were in blossom, a heavy southeast wind prevailed, which removed the pollen, or from other blighting influences prevented fructification, so these crops were almost an entire failure.

There was no rain in the spring, so that transplanting was not successful, save when done very early. Strawberries, although affected by drouth, made a fair crop. Raspberries were badly dried up.

Blight was uncommonly severe upon apple trees, scarcely a variety of standards or of crabs escaping its withering influence. From present indications it would seem to be time and money thrown away to plant any of the old sorts of standards. Quite large sales from the

nursery of Peter M. Gideon were made this fall, and we hope varieties approaching ironclad have been introduced.

The grape vines received from Prof. Porter succeeded well, making a healthy growth.

We think the growth of all fruits last season was healthy, and went into winter quarters in good shape, which, with the depth of snow covering the ground, would warrant the hope of their coming out in good shape in the spring.

Much difficulty was experienced in securing the germination of garden seeds, and many gardens were nearly failures on this account.

The heavy winds that prevailed in early spring blew the seed entirely bare on many a grain field, and in many cases reseeding was resorted to, and in many more it should have been.

Increased attention is being given to small fruit culture, which is a hopeful indication.

REPORT FROM NICOLLET COUNTY.

By C. F. Brown, St. Peter.

As per request, I hand in a rough report of fruit for the county for 1887. Could have made it more elaborate, perhaps, but have been pressed for time.

I cannot give a very flattering report of the fruit production of this county for the year 1887. On account of the drouth, fruit in general has done very poorly.

SMALL FRUITS.

Strawberries on one year vines produced a very fair crop. Old vines did not do well.

Raspberries, a short crop, but usually do well with good care.

Blackberries coming into bearing so late in the season felt the effects of the drouth very severely, and were a failure.

Grapes were a good crop and of excellent quality. Col. J. C. Donohower has kindly given me a list of those raised by him last season, which demonstrates that, under an intelligent management, in a favorable season quite a variety can be produced, to-wit: Brighton, prolific and very satisfactory; Worden, prolific and very satisfactory; Moore's Early, prolific and very satisfactory; Martha, prolific and very satisfactory; Rogers No. 15; Amber Queen. doing better each

year; White Ann Arbor, not satisfactory; Concord, good; Hartford Prolific, prolific; Wilder, or Rogers No. 4, splendid grape, but drops from vine. He also has other varieties, but has lost names for them.

Apples were a capricious crop; in some localities Transcendents, Hyslops and Duchess produced good crops, though not of the best quality, but generally speaking they were a failure. A few Gen. Grant were marketed. Most of the old orchards have died out, and parties who have been trying to raise apples for the past twenty-five years are discouraged; and many of the "coming seedlings" have gone the way of the "ironclads." Mr. E. Myer, of this county, who is a veteran pomologist, pins his faith (what he has left) on the Duchess and pronounces it the most reliable for this locality. His orchard of Duchess—now nearly all dead—have paid him well, yet he is inclined to let some younger enthusiast carry the fruit banner in the future for this locality.

Currants were a very poor crop, the lightest ever known in this locality.

I am not a practical fruit man, and only have a natural inclination and love for the subject without a chance to put my theories into practice.

REPORT FROM MURRAY COUNTY.

By O. F. Norwood, Balaton.

The past season, although a little dry, was on the whole a favorable one. The few trees scattered over the prairies all bear some fruit, and where good care had been bestowed apples were a good crop.

Leonard Aldrich, on the shores of Lake Shetek, raised over one hundred and twenty-five bushels of apples from only a few trees that have fruited three to four years, and sold for over one hundred dollars, besides raspberries, strawberries, and other small fruit, which was plenty.

With us fruit was about the same as last year, grapes being a good crop and of good quality, but this year I have to report the first appearance of blight on the Transcendent, which killed a few twigs about a foot in length. We planted last spring two hundred trees of different kinds for trial, and every one of them made a good growth and seem to be in good shape at present. The rabbit is the worst enemy we have to apple trees here, and if they are not exterminated there is little use in planting largely of apple trees. I have tried all

remedies I have seen, but nothing avails except wrapping paper around the trees and binding it on well, so the wind will not blow it off.

The conclusion reached after a five years' observation is, that every family can have all the apples and berries they want for home use, if they will plant and care for a small fruit-garden, and can raise fruit to sell if he has the inclination; but it is a duty every man owes to his family to raise all the family needs, and that enough to last the whole year.

THE RABBITS.

I have interviewed many farmers the past week or two, and the general complaint is that the rabbits are much worse this year than ever before, and that unless the plague is done away with it is useless to plant apple trees, as in many places every tree is entirely destroyed.

I take it for granted that the same trouble exists all over the State, and that something ought to be done to at least diminish the numbers of this, the worst enemy to fruit trees. Would it not be advisable to have a law enacted placing a bounty of, say, twenty-five cents a rabbit? This would do away with them on short notice, and cost no more than a smaller bounty extending over a longer period, thus costing as much in the end.

REPORT FROM MURRAY COUNTY.

By John Fitch, Tracy.

I have an orchard of eighty-five trees set about eight years. Of these twenty-five are Duchess, a few of Wealthy, Transcendent, Hyslop, Early Strawberry, Orange, etc. The orchard commenced bearing about four years ago, but it was nearly destroyed last season by the snow and sleet breaking down the trees.

Wealthy has proved very hardy. I lost about five per cent of my trees from drouth the first year, but most of the vareties raised have proven hardy. Location on northeast shore of lake Sarah; soil, dark, sandy loam, northeasterly slope; drainage good; sub-soil sand and hard pan. Trees appear to be healthier than on richer land, and freer from winter killing.

Have raised Wilson strawberries with good success; also a few

Mammoth, Bidwell and Sharpless. Mammoth proves to be the best with me. For winter protection I mulch with wheat straw and chaff after the ground commences to freeze. In the spring I rake off the straw and leave between the rows until there is no danger from frost. Have grown some very fine crops, having an abundance for home use and some to spare. Have supplied my neighbors with plants, who are now raising their own berries.

Have several varieties of raspberries. Blackcaps of the common or native varieties, such as grow along the lake shore, succeed better than the cultivated sorts. They are very productive and require no protection; fruit smaller than of tame varieties. Have had indifferent success with grapes.

We have a number of enterprising farmers in Murray county who are growing fruit successfully. Capt. Aldrich, one of the first settlers here, near Currie, on Lake Shetek, is one of our most extensive fruit growers. He has a large number of bearing apple trees, and has apples on the market every year, both of standard and hybrid varieties. Duchess and Wealthy are his favorite sorts. He has some twenty acres of natural timber for protection. He is also a very extensive grower of strawberries, raspberries, currants and grapes. He has a favorable location for grapes and is growing a number of varieties.

Mr. McIntyre a neighbor of Capt. Aldrich, is raising small fruits quite successfully; also apples of which he exhibited some fine specimens of Duchess and Wealthy at the fair the last two years. He has no protection from the north and his trees were not broken by the snow.

My neighbor, J. R. Cleveland, has very good success with strawberries and red raspberries, and markets several bushels of fruit each year. He had a similar experience with myself with apple trees; snow spoiled them last spring. If I were to set out an orchard again I would set it on the north side of a grove. Trees on the prairie need protection from winds in summer. Our heavy southwest winds shake off the fruit. There is no trouble raising Duchess, Transcendent and Hyslop here without any windbreak from the north, as they stand quite as hardy as the oak.

We experience no difficulty in growing small fruits where any attention is given them whatever. Every farmer should raise enough for his own use. They are no harder to grow than the common vegetables of the garden. Besides the pleasure and satisfaction afforded there is the gratification of having the choicest fruit, gathered fresh from your own grounds. More attention should be given to it,

especially to the growing of small fruits. It may not be profitable to spend too much time on apple trees, but everyone can have an abundance of choice home-grown small fruits of every kind.

Very little attention is given to native plums, as they grow wild and can be gathered by the hundreds of bushels along the shores of our lakes and running streams, and the fruit is very fine in its season.

Mr. Mellen, north of Curry, on the Tracy road, has a fine farm and a good orchard. His trees look healthy and bear well. He exhibits some fine apples at the fairs. He also raises fine crops of strawberries and raspberries; I do not know what varieties.

Alfred Terry, of Slayton, has a farm south of town, and is taking a great deal of interest in fruit and ornamental trees. He is growing standard and crab varieties of apples successfully. A number of others might be mentioned who are engaged in fruit growing in this county, and who find it both a pleasurable and lucrative occupation.

STATE EXPERIMENTAL STATION.

UNIVERSITY OF MINNESOTA EXPERIMENT STATION OF THE COLLEGE OF
AGRICULTURE.

Report of Prof. Edward D. Porter, Supt., St. Anthony Park.

Mr. President and Gentlemen :

I should present to you a much more detailed report of the operations of our experiment station, were it not for the fact that my work will be embraced in my own published reports, and it is not worth while perhaps to duplicate the report. You will find a portion of what I have to say in my first bulletin, which has been issued recently. I will refer to that briefly.

INTRODUCTORY.

As the work of this Agricultural Experiment Station is now organized on a new basis, to meet the requirements of recent legislation, it may be well to present a brief review of the work heretofore done in this department.

The act of Congress of July 2, 1862, donating public lands to the several states, for the benefit of agriculture, and the mechanic arts, authorized the expenditure of a sum, not exceeding ten per cent, of

the net proceeds of the sales of such lands, for the purchase of experimental farms.

In 1868, the legislature of Minnesota authorized the board of regents of the state university to expend \$8,500 from this fund for this purpose, and a tract of land near the university was bought, cleared, fenced, ditched, and put under cultivation, and under the direction of Prof. Charles Y. Lacy, was used as the Experimental Station, and School of Practice of the College of Agriculture up to 1880. Various lines of agricultural experimentation were undertaken by Prof. Lacy, and full detailed reports of the same were made annually to the board of regents, and will be found in their published reports for the years 1875-6-7-8-9, and '80.

Prof. Lacy withdrew from the institution in 1880, and in January, 1881, Prof. Edward D. Porter was placed in charge of the department of the Theory and Practice of Agriculture. After operating the farm for one season he was convinced that from the character of its soil, its proximity to the city, and continued subdivision by public thoroughfares, it was entirely unsuited for the purposes of an experiment station, and urged upon the board of regents the necessity of disposing of it and purchasing a more desirable location. The plans proposed were approved, and the legislature having given authority for the sale, and provided that all the proceeds of the same should be used in the purchase and equipment of the new farm, the old one was subdivided and sold from time to time up to the present, yielding sufficient funds to purchase and equip the new station. The location of this farm, its character and equipment, and the work accomplished up to Jan. 1, 1887, are fully set forth in the report of the department of agriculture, to the board of regents, and published as a supplement to their fourth biennial report to the governor.

The legislature of 1885 directed the board of regents of the University of Minnesota to establish, as soon as practicable, in connection with that institution, an Agricultural Experiment Station for the purpose of promoting agriculture in its various branches, placing it under the control and supervision of said board, making the professor of agriculture its general superintendent.

Unfortunately there were no funds placed at the disposal of the university to carry out the objects of the act, and there were none at the command of the department for that purpose, as all the funds derived from the sale of agricultural college lands were, by act of Congress, required to be devoted to the purposes of instruction. The experimental work given in previous reports, and accomplished up to the

present time, has been done with limited and unskilled assistance, and in such intervals of time as the director could secure from a mass of other duties.

The passage by the last Congress of what is known as the "Hatch Bill," making liberal appropriations for the work of agricultural experiment stations in all the states, and the prospect that the funds thus provided for will be available at an early day, will enable the board of regents to properly organize this station for the work contemplated. The increase of scientific and skilled assistants, a subdivision of labor, and release from a mass of details, will enable the director to give largely increased attention to the work of the station.

In carrying out the objects of the organization, we cordially invite the co-operation of the citizens of the State. Suggestions as to lines of experimental work, problems to be solved, inquiries relating to agriculture, horticulture, stock, and the dairy, will be cheerfully received and answered as far as possible; but no work will be undertaken unless of public value, and the results of which we are at liberty to use for the public good.

Specimens of grains and grasses; seeds of fruit and forest trees; vegetables, plants, and flowers that are true to name; varieties of beneficial and injurious insects; samples of mineral waters and ores, and whatever may illustrate any department of agriculture will be gladly received, and due acknowledgments made in annual reports. Directions for collecting, packing and shipping such specimens will be furnished on application, and all expenses paid.

Bulletins will be issued at least quarterly, giving the results of experimental work as fast as completed, together with such suggestions and information as may be thought valuable to the farmers of Minnesota. These bulletins and the annual reports will be sent, free of charge, to each newspaper in the State, and to such individuals as may request the same.

OUTLINE OF WORK.

There are several other matters to which I desire to call attention. As already intimated, the work of our experiment station is not confined exclusively to horticulture; it is designed to cover all the operations of agriculture, and we have of course to devote a due amount of attention to each; horticulture comes in for its proportion, and up to the present time it has received the lion's share of our work, for the reason that the facilities at hand enabled us to devote more attention to this line of work than to any other.

I have felt that this Horticultural Society is the best organization of farmers in the State, and that you were at my back to second my efforts, and I may add that I have been trying to do the best I could for the interests of horticulture in Minnesota. Our first work in this line has been, the tests of Russian apples. At the present time we have 302 varieties of these apples under cultivation. The most of these of course are from the experimental lists of Russians, and as to their behavior you will find a detailed report in our Bulletin, No. 1.

A word in regard to these Russian lists and for the benefit of persons unfamiliar with their nomenclature; the numbers, standing alone, are those of the government importation of 1868. When the letters "M" or Orel, or Vor, or Riga follow the numbers, they indicate later importations from Moscow, Orel, Voronesh, or Riga, in Russia.

We have selected for trial only such varieties as are thought best adapted to the soil and climate of Minnesota, and the experience of the last three winters will compel us to reject many of them. We have, however, found a few varieties that have proved to be perfectly hardy, passing through the severe tests of our climate without a bud injured, and if we can secure but a single one out of the three hundred on trial—hardy, of good quality and a long keeper—we shall feel amply repaid for our expenditure of time and labor, as this will constitute a foundation for future work.

REPORT ON CONDITION OF EXPERIMENTAL ORCHARD OF RUSSIAN APPLES.

The winter of 1886-7, like its predecessor, was one of unusual severity, differing from the previous winter in the greater snowfall, which covered the ground to a depth of from one to two feet from the middle of November well into the month of April. The snow drifted somewhat in the Russian orchard, but probably the severest time for the trees was the short season of thawing days and freezing nights which occurred in the latter part of March and the first two weeks of April. The melting snow formed sheets of ice by freezing solid at night, remaining thus, in some cases, two or three days at a time, and then thawing, only to be again frozen.

As was said of the Russian orchard in the report of this department for 1886, it had been planted in the spring of 1885 in the most exposed situation the farm afforded. It may be claimed that such a situation does not give the trees a fair chance, since any intelligent farmer would choose a protected location for an orchard; but the Russian

apples were heralded as being absolute ironclads, and if there was possibility of their growing on the open prairies of Western Minnesota, then surely they should withstand the greatest exposure that could be given them in this timbered region.

The result of the winter of 1885-6 on the Russians, as heretofore reported, was the death of thirty-two and one-half per cent of the number planted. In the place of the thirty-seven trees thus winter-killed, others were set, of varieties not before standing in the orchard.

The summer of 1886 was as favorable for tree growth as could be desired, and the trees were well matured when winter set in. Potatoes had been planted between the tree rows, and good cultivation had been given the entire orchard until about the middle of July, at which time the weeds were kept down by scalping, the ground being disturbed save at the surface. In the forest tree nursery, cultivation was continued longer, and the plow was more frequently used, but the forest trees passed through the winter without injury, showing complete ripening of the wood.

The following notes, taken in August and in November, will show the condition of the Russian apple trees at those periods. The dead wood on the trees had been left purposely, as giving the best answers to questions regarding their hardiness. It will be noticed that a few duplicates are named, in which there is a difference in condition. The notes were taken while passing from tree to tree; in no case are there more than two trees of a kind in the orchard, and in many instances there is but one; where duplicates occur, the trees were not planted together, as was usual. The "killing" referred to was the result of the winter of 1886-7, and, unless otherwise noted, the measurements of dead wood refer to the growth of the summer of 1886, and the new growth to the season of 1887.

THE VARIETIES.

177. Green Streaked. Of the two trees of this variety, one killed back one inch, and in August was in fine condition, having made an excellent growth; leaves good and tree healthy. The other was barely alive. Growth of 1887, seventeen inches.

934. Both trees winter-killed badly, all the one-year-old wood being dead. Strong shoots had sprung from the roots of both trees. Growth of 1887, sixteen inches.

187. Glass Green. All last year's growth killed, but made a growth of twenty-six inches in 1887.

- Possart's Nativ. Killed to snow line.
287. Riga Transparent Juicy. Dead.
287. Kremer's. Almost dead.
- 87M. Herren Apple. Weak.
- Dobruï Krestiana. Killed back badly. Growth of 1887, twenty-six inches.
- Green Sugar. Almost dead.
262. Veronesh Reinette. Killed slightly; made but little growth at summer, but made a growth of eighteen inches in season of 1887.
375. Cinnamon Pine. Killed to old wood; strong growth last summer, and twenty-two inches in 1887.
105. Russian Gravenstein. Killed back six inches; healthy growth this season, making shoots twenty inches in length.
- 542 Yellow Calville. Planted last spring; weak. Made but four inches growth in 1887.
- Sklanka. Planted last spring; growing first-rate; shoots of this season's growth twenty inches long.
457. Klineff's Apple. Killed back most of the new wood; trunk sun-scalded somewhat. This year's growth good, averaging twenty-two inches.
185. Anisette. Killed back three inches; fine growth the past season; good foliage, shoots of 1887 twenty-four inches long.
161. English Pippin, Longfield. One dead; other killed almost to old wood and badly sun-scalded; vigorous new growth, averaging twenty-two inches.
316. Red Queen. Killed back to old wood, but made a growth in 1887 of twenty-three inches.
365. Killed to old wood; strong shoots; growth of 1887, twenty-six inches.
38. Vor. Flat Veronesh. Killed but very little; in good condition; average growth of 1887, twenty inches.
502. Rambour Queen. Killed back badly; very strong shoots of 1887 growth, twenty inches in length.
- Antonovka. Killed all new growth and part of two-year old wood in two trees; strong growth from trunk, averaging twenty-eight inches.
252. Aport. Killed back to old wood, but made a growth of twenty-seven inches in 1887.
262. Charlamoff. Killed back to old wood.
361. Pointed Pipka. One tree killed eight inches; new growth ex-

cellent, averaging twenty-one inches. One killed but little, being the best in the orchard; no scald; fine growth; healthy foliage.

984. Koursk Anis. Killed but slightly; leaves small and good; tree healthy, having made a growth of twenty-eight inches in 1887.

230. Titus. In fine condition. Killed but very little. Shoots twenty inches long in 1887.

599. Romna. Two trees killed back badly, but sent out strong shoots the past summer, averaging eighteen inches.

Borovinka. Lateral branches nearly all dead, but strong new growth of twenty-six inches.

Gruchevka. Two trees have stood the two winters better than any others in the orchard. Killed back one inch. Good growth the past season; leaf not so thick as in many more tender sorts. Growth of sixteen inches in season of 1887.

477. Christ Birth. One dead; one killed to snow line, but made a growth of thirty-one inches in 1887.

413. Cross. Killed to snow line. Made a growth of twenty inches in 1887.

269. Rosy Aport. Killed back six inches; good growth the past summer, averaging twenty-three inches.

Yellow Transparent. Killed to snow line, twenty-seven inches growth in 1887.

268. Saccharine. Killed to old wood; strong new growth of twenty-six inches.

202. Hare Pipka. Killed almost to old wood; fine new growth of twenty-six inches.

200. Red Pipka. Killed one inch; good healthy growth the past summer; two trees averaging seventeen inches growth in 1887.

52. Vor. Killed eight inches; poor growth the past season, only three inches.

582. Leaders killed eight inches; laterals almost to old wood; strong new growth of twenty-eight inches.

365. Killed back six inches; strong growth in the tops, averaging twenty-four inches.

Aport Orient. Killed one inch; is doing well; made a growth of twenty-four inches the present season.

284. Kremer's Glass. Killed back almost to two year wood, but made a growth of twenty-four inches.

290. Ukraine, killed back eight inches; fine healthy growth the past season of sixteen inches.

Plodovitka. One dead; other killed one-half; growth all water sprouts.

Rubet's Nativ. Killed four inches; good new growth of twenty-one inches.

Kiev Reinette. All the one-year-old wood dead on one tree. The other killed back one to four inches and in good condition.

277. Lead. Killed back into old wood; growth of 1887, fourteen inches.

206. Czar's Thorn. Killed eight to ten inches; sun-scalded but made a growth of thirty inches in 1887.

210. Vinograd. Killed back four inches; good growth this season.

469. Grandmother. Killed to old wood; very strong new growth of thirty-six inches this season.

4M. Ostroff's Glass. Killed back six inches; top very weak; strong shoots from below of twenty-eight inches.

461. Ribbed. Dead to snow line.

407. Blackwood. Very weak in the top; strong water sprouts of thirty inches.

396. Killed one-half.

Arkad. In one all the new wood killed; the other killed back but one inch, and has made a good new growth of fourteen inches.

282. Veronesh Reinette. Killed back two inches; fairly good new growth of fifteen inches.

984. Kursk Anis. Killed back two inches; new growth of twenty inches; trunk clean and bark good.

21. Vor. Yellow Calville. Killed back one to two inches; growth in top good; trunk of one tree in bad shape, but made an average growth of twenty-eight inches.

164. Heidorn. Killed one inch; fairly good new growth.

56. Vor. Gipsy Girl. Killed back one-half inch; trunk in bad shape; leaves all eaten off by caterpillars; moderate growth in top, good shoots near the ground of fifteen inches growth.

Early Sweet Veronesh. One nearly dead; other killed back four inches and in weak condition; growth for the season of 1887, eighteen inches.

22M. Blushed Calville. Killed back one inch; slow grower, but evidently in perfect health; made shoots of nineteen inches in length during 1887.

20M. Kursk Reinette. Killed one to four inches; growth healthy, and twelve inches in length.

378. Hiberna. Killed very little; good growth.

Arabskoe. One year-old-tree, set in spring of 1886, killed back eight inches, and made growth of twenty inches in 1887.

214. Garden. Tree same as last; killed back four inches; good growth the past season.

44M. Sandy Glass. Weak during summer, but made a growth of twenty-eight inches during the season.

304. Switzer. Killed back six inches; good growth of twenty-five inches.

4M. Ostroff's Glass. Killed back one inch; good healthy growth of twenty-six inches.

Duchess. Of fifty-two Duchess trees planted in the spring of 1885, at the same time and in the same orchard with the foregoing lists of Russians, half are dead and of the remainder the new growth killed back almost as bad as did Antonovka. The average growth of these trees in 1887 was sixteen inches. In another orchard, which stands on a northeast slope and is well protected on the south and west by an oak grove, the Duchess killed back but little.

REMARKS.

Of the sixty-five varieties noted, not one started growth from terminal buds in the spring of 1887. Those which killed back one inch or less, and which, in such situations as are ordinarily chosen for orchards, may fairly be presumed to be perfectly hardy in this latitude are Green Streaked, Veronish Reinette, Flat Voronish, Kursk Anis, Pointed Pipka, Titus, Gruchevka, Red Pipka, Aport Orient, Arkad, Yellow Calville, Heidhorn, Gipsy Girl (56 Vor.), Blushed Calville, Hibernial and Ostroff's Glass.

It is not fair to assert, however, that the remainder of the list is too tender for culture in Minnesota; nor, on the other hand, can entire hardiness be claimed for the above list.

The foregoing notes merely tell the action of the varieties named under certain conditions, and so far as location is concerned, it should be borne in mind that these conditions were decidedly the most severe that could be chosen.

A comparison of the foregoing list with the Duchess will prove interesting. While the average of the Duchess trees did not stand the winter much, if any, better than Antonovka, which killed back to old wood, there were a few trees that produced good growth from buds near the base of the one-year-old branches, and averaging twenty-two inches in length. The Duchess seems to have in an unusual degree the power of recovery from winter injury, and it may be that many other Russians will develop the same quality. The Duchess has long

been known to winter-kill in this latitude, but all apple growers regard it as a safe investment, and they take it as a standard of hardiness.

The experimental orchard in its two year's history has shown sixteen varieties of apples to be hardier than Duchess, when grown under exactly similar conditions and side by side. There yet remains in the Russian nursery over one hundred and fifty varieties to be subjected to the same test that these have stood. When an effort is made to name sixteen varieties of native apples which would show equal hardiness under the same conditions, the comparison must result favorably to the Russians.

The experience of the past two trying winters has compelled us to reject many varieties. But we have some that are hardier than the Burr oak, because if you examine the terminal buds of the oak you will find them killed back two or three inches, while I have Russians so hardy that the terminal buds are not injured. Hence it is patent that when we have a tree of that character we have a foundation to build upon and something of real value.

In addition to the foregoing list of Russian apples we have devoted much time and attention to the culture and comparison of all the leading varieties of fruit grown in Minnesota, embracing native and foreign plums, Russian bean, forty-two varieties of grapes, all the promising varieties of strawberries, currants, gooseberries, blackberries and raspberries, as well as a full line of trees, shrubs and plants for forestry and ornamental planting; these are in their third season of growth and their value will be reported upon at your next meeting.

In the line of market gardening we have had growing the past year almost every variety of vegetable known to our catalogues, and their condition and value attested by the hundreds of visitors who have manifested an interest in our work by making a personal inspection.

Before closing this report I wish to call the attention of this Society to the importance of the collection, improvement and dissemination of the best varieties of our native trees, shrubs and plants. In many of them I see large promise for the future of horticulture in Minnesota. Our native varieties of plums, grapes, wild fruits and flowers, from their value, beauty and hardiness, furnish a splendid foundation for new and improved varieties. Many of them have a local reputation and their merits are reported from time to time at our meetings, but for want of systematic attention they are lost sight of, and their dissemination postponed for a generation. The collection and testing of these native productions should be the duty of our experimental station; and this brings me to the subject of

CO-OPERATIVE EXPERIMENT STATIONS,

a plan for which I wish to outline to you, and if it meets your approval, to give it your endorsement and support.

I would propose the selection of one or more persons in each county in the State who are well qualified to undertake the work in their special lines of agriculture and horticulture, who should be invited to become correspondents and observers for the central experiment station. To these assistants the station would furnish free of cost collections of seeds, plants and cuttings, for trial and dissemination in their several localities, instruments for making observations of temperature and rainfall, blanks and instructions for their reports, and such other assistance as might be required, only asking in return that they would render a report of their work and send back to the station any new varieties of trees, plants or shrubs, which they might find in their sections of the State for further examination and distribution. Those reports would be collected and arranged by the scientific force at the central station and published for the benefit of the whole State. Such in brief is the plan I would propose for the organization of this experimental work. Does it meet your approval?

President Elliot. We will take up this subject this afternoon. Different ideas are entertained in regard to this work. Let us take time to consider this matter and give it such endorsement as we think it best to give.

The meeting then adjourned till 1 o'clock P. M.

AFTERNOON SESSION.

FRIDAY, JAN. 20, 1888.

The meeting was called to order at 1 o'clock P. M. by President Elliot.

Mr. Smith moved as the sense of this Society that the plan of co-operative experimentation, as outlined by Prof. Porter, be heartily approved, and that we pledge him our active assistance and support.

Mr. Cutler. Mr. President, I think it would be well enough for the Society to understand this question before voting upon it. There are some matters in reference to it that I don't fully understand. If this money is to be expended it seems to me it ought to be used so that every part of the State will receive the benefit, and if there is to be a division of the work why should not the fund be divided? I understand

there is \$15,000 appropriated by Congress to make these experiments and to establish experiment stations. I do not think that one central station should get the whole of that appropriation.

Col. Stevens. It seems to me the terms that Prof. Porter mentioned are most liberal, as he will furnish the tools, seeds, shrubbery and nursery stock and everything of the kind, and the man who attends to those things that he furnishes, gets the benefit. If he has fruit trees or anything else that he raises, he sets them in his own yard and orchard, or gives them to his neighbors. I think there are plenty of men to be found who would be glad to render the assistance and receive the benefits.

Mr. Smith. I don't think there will be any difficulty in obtaining plenty of good men in every county for this work.

Col. Stevens. No; I don't think we should be too selfish in this matter. I think the terms offered are very liberal. McLeod county was my old home and I think Mr. Cutler will be very willing to take hold as one of the enterprising horticulturists in that county and help to build up this great enterprise.

Mr. Young. Mr. President, I don't think it is necessary to discuss this question at all. The Society is not expected to force anybody to make experiments. It is proposed that its members volunteer, or that the Society recommend the adoption of this system, and it is expected that farmers and others will come forward to help themselves this much, and if they will not they alone will be the losers. But I am very confident, that there are men out on the Western prairies that are spending their money trying to make a success of their farming operations there, who would be only too glad to take hold of this work. I get letters every day or two asking information, from these men, and I think Prof. Porter will be backed by the most intelligent part of the community, in the western part of the State.

Mr. Underwood. The gentleman says it is not worth while to discuss it. I don't understand it is a question for discussion, but it is simply whether he can secure a strong expression in support of this undertaking. Now, as an individual member, I think I should feel proud to assist Prof. Porter as a member of the Horticultural Society, and to hold up his work in every possible way. That is what this question is brought up here for. And as far as men volunteering to give their time to this work, if it is proposed to do that, I think there are plenty of farmers in the State who would be glad to give their time and take the benefits of the knowledge they will gain thereby and the assistance they will receive from the central station.

Mr. Young. I did not mean to say that it was not worth while to discuss the project, but we might discuss whether volunteers could be obtained or not.

Mr. Gibbs. If I understand this question,—I was not here this morning to hear Prof. Porter's report, but if I understand it,—a person is not required to procure stock for distribution or furnish trees for other parties, but his stock is furnished ready to his hands and all he is expected to do is to plant it in a favorable situation and to take care of it, and to make a report from time to time to the central station.

Prof. Porter. That is the idea, only it is designed to be upon a definite plan to secure uniformity of work and reports. For instance, we make experiments with Russian wheat. We take forty or fifty bushels of wheat grown or procured by the central station, and distribute it in sufficient quantities for the farmers to test. All I want to know is the manner in which the experiment is conducted, the locality, character of soil, and to get reports that are uniform, and to send out these reports in our bulletins, for the benefit of every farmer in the State.

Mr. Gibbs. I had in my mind the experiments to be conducted in the line of horticulture; is it the intention to combine these with other experiments?

Prof. Porter. We expect to secure specialists in every line of agriculture and horticulture, men who will take an interest in the work entrusted to them, and well qualified for its execution. From such men we always get the best results.

President Elliot. The question came up in regard to how these experimenters were to be reimbursed for their trouble. I think perhaps when Mr. Cutler comes to look at it and to see just the bearing it would have, if we were to go to work and distribute this \$15,000 all over our State, he would see that it would be so thin that we should lose all the results. But if we can have one central station to guide and conduct this work, and have volunteer workers outside, as Prof. Porter has outlined, then we would get at something that would be definite. If we attempt to spread out it seems that we could not accomplish so much.

Mr. Gibbs. I know Mr. Cutler, here, and there is not a man in this Society, I think, that will do more than he in aiding in this work, and the object of my speaking was to relieve his mind as to the effect this would be likely to have upon the general public, in sending out these different things for experimentation. It is not expected that

Prof. Porter will send out things that are not likely to succeed. Those will be confined to his own station, and he will only send out the best. He is, therefore, really conferring a favor upon anyone, whether an orchardist or gardener, in putting only reliable stock in his hands. I only wish he had the territory of Dakota under his jurisdiction, and that some of us out there might share in these advantages with the farmers and gardeners of Minnesota.

Mr. Sias. Our chairman says that we want to separate this \$15,000, and if it was spread out over the whole State for the support of these different stations it would be pretty thin. That reminds me of a remark that Fred Douglas made at the time that Franklin Pierce, of New Hampshire, was running for President of the United States. He said that "Mr. Pierce was a good third-rate lawyer of New Hampshire, but you come to spread him out all over this Union he will be so thin he won't amount to anything." Mr. Douglas was simply mistaken for he did amount to something. He became soon after a President of the United States.

I have been experimenting at Rochester for the past twenty-five years and I have not received a dollar to meet the expenses; have been working hard and living cheap, experimenting in trying to find that "winter apple." I think a number here have been trying, and directing their attention in the same direction. I am satisfied from my experience during these twenty-five years that we should still continue and follow the direction given by Dr. Von Mons and of Andrew Knight. And I think that the plan of Mr. Knight, of cross-fertilization, is probably the shortest route, and I intend to follow that with some varieties that are much hardier than Duchess, and I think by careful crossing we may hope to find a late keeper and in this way be likely to get a winter apple. If it can be done by any of these superintendents I am satisfied; but I believe Prof. Porter can use this fund to good advantage, and I believe he will do it in the way of experimenting. I believe his plan is a good one.

Mr. Pearce said he had drawn up a resolution similar to the one under consideration, which had reference simply to horticulture. He had experimented at Minnetonka a number of years and become fully satisfied that fruit could be grown in large quantities all over the State. During the past winter he had written to many persons and proposed to furnish them stock on a small scale to start with. Prof. Porter proposed to divide this work among specialists. One man should make a specialty of fruit and nothing else. He would suggest the sending out of nothing but known and tried varieties to experi-

ment upon; every farmer should put them out, and by following a particular system the same results would be secured in every instance, and then not one in fifty would make a failure. He thought this plan would do more in five years than had been accomplished heretofore in twenty in the way such work had been conducted, because it would reach every man in the State. Every man would know what his neighbor has, and know the quality of what he received and its duplicate could be obtained at the station. He had known such instances and considered it the best system that could possibly be followed; there was nothing equaling it. He was heartily in favor of the measure.

President Elliot. This subject has now been fully discussed, and if I understand it, the question is upon the endorsement of the plan outlined by Prof. Porter. What is your pleasure in the matter?

The plan for the co-operative experimentation was unanimously approved.

Mr. Cutler offered a resolution favoring the passage by Congress of the bill for the reduction of postage on seeds and books, which was adopted.

CORRESPONDENCE.

The following letter was received from Mr. Keffer of the Dakota Agricultural College.

FROM DAKOTA.

BROOKINGS, DAK., Jan. 17, 1888.

S. D. Hillman, Secretary, etc.:

I regret that business prevents my being with you at the meeting of the Horticultural Society, which convenes to-day. I should have written this letter last week, but, as you are probably aware, we are blockaded. I write now more in hope that the blockade will be "raised" to-morrow than in faith of such good fortune.

I congratulate your Society on the good work it has accomplished during its legal infancy, and now that it has arrived at man's estate, we on the outside—especially we of Dakota—will expect still greater things.

The meeting at Huron was but slimly attended, but great interest was manifested, and I feel sure we have the nucleus on which to build a strong society. We were very glad to see your delegate, Mr. Sias;

he proved a veritable missionary, and the gospel he brought was good sound horticultural gospel. Do you know the addresses of parties who have planted Russian apples? I would be under obligations to you if you would send me a list.

Hoping you may have an especially profitable and pleasant session, I remain.

Yours very truly,

CHAS. A. KEFFER.

FROM RUSSIA.

MOLIE-LEV-UPON-THE-DNIEPER, RUSSIA, FEB. 19, 1887.

S. D. Hillman, Secretary, etc.

I duly received your favor of Dec. 27, 1886, and must apologize for not replying to it sooner.

I have not had opportunity to write the promised paper, having been engaged all the time in this northern region.

I have received to-day a letter from Mr. Ragan informing me that he has received the scions, and will send you the package destined for your Society. Hope that the scions will arrive in good state and be of use to the Society.

I intend to send you, next fall, scions from trees grown here in Petrosavosk under the 62° north latitude.

I wrote you that I have not seen nor eaten of the fruits of the varieties that were praised to me; one that I had the disadvantage to taste was bitterly sour. It is also not fair to claim of a tree grown in such latitude to give first-rate fruit.

But taking in consideration that they endure here often 29° ream of frost, and all the winters are blowing blizzards, such tree must be a truly hardy one, and can be undoubtedly of use as material to your intelligent orchardists to train for your State for an ironclad variety of apple.

Leaving this country, I have asked friends to send me, next fall, seeds and scions from apples of this place, and shall send you some for trial.

Your amiable offer to send me the last report of Iowa will be duly appreciated, if you shall have the kindness to mail me a copy.

I take also the liberty to ask you to have the kindness to send me seeds of Western Catalpa (*Catalpa speciosa*) and box elder (*Acer Negunda*) as samples, and to give me prices for one kilogram. In the

report of the commissioner of agriculture I have read that these trees are easily propagated, rapid in growth and give valuable timber.

I have the intention to recommend them to be tried by our southwestern railroads to protect their tracks from snow drifts.

Have the amiability, also, to name me a reliable seedsman from whom it would be possible to have these seeds in greater quantities.

I remain, with great respect,

Yours truly,

G. DOPPELMAIR.

Aug. 6, 1887.

S. D. Hillman, Sec'y, etc.

Returned from a long absence to Molislev. I have had the pleasure to receive your kind letter and the regards of your Society. Please accept my warmest thanks for the same.

From Kiev I have sent you the promised report of our department of agriculture, about fruit growing in Russia. It was sent by my bookseller to a false address and returned to Petrosavosk. Hope that you shall receive it this time.

The summer here was very cold and rainy; hail and storms were very frequent. The leaves and apples have suffered severely.

Very respectfully yours,

G. DOPPELMAIR.

FROM SECRETARY GARFIELD.

GRAND RAPIDS, MICH., Sept. 27, 1887.

S. D. Hillman, Secretary, etc.:

Your pleasant note sent me at Boston has been forwarded here. It would please me greatly to visit your State, and I hope to do so some time. * * * *

I feel that the American Pomological Society is more truly national to-day than ever, and by careful methods and earnest labor, it can be made to serve American Pomology better than ever before. I shall always gladly receive a letter from you.

Sincerely yours,

GARFIELD.

FROM ONTARIO.

GRANTON P. O. ONT., April 26, 1887.

S. D. Hillman, Secretary, etc.:

I must apologize for being so tardy in sending my fees for membership in your Society. I belong to a number, and from no other report do I get so much valuable information. Enclosed please find the amount of membership fee.

Dear Friend, will I ever have the privilege of meeting you again on this earth? if not, may our Lord Jesus guide, keep and save us, so we shall meet again in his eternal world of blessedness and rest.

Yours truly,

JOHN LITTLE.

FROM NEBRASKA.

TABLE ROCK, NEB., June 15, 1887.

S. D. Hillman, Secretary, etc..

Permit me to acknowledge the receipt of one dozen copies of your State Horticultural Report for 1887, and to thank you for the same. Will reciprocate as soon as our new volume is out, which will not be completed until late in July or first of August.

Crop prospects are good; fruit not to exceed one-half crop except blackberries, which promise a large crop.

Yours fraternally,

S. B. BARNARD,
Sec. Nebraska Hort. Society.

Following is the paper contributed by Hon. D. B. Wier on Native Plums:

NATIVE PLUMS AND HOW TO FRUIT THEM.

By D. B. Wier, Lacon, Ill.

The Native plums are the indigenous, or wild plums, of this continent and their direct descendants from seed. These plums all belong to the genus *Prunus* of the sub-order *Amygdalea*, (the Almond family) of the order *Rosacea*, to which nearly all our cultivated fruits belong. To the genus *Prunus* belong nearly all the stone fruits in cul-

tivation, and it has representatives with edible and useful fruits, in the wild state in nearly every portion of our country, and perhaps of the continent.

SPECIES.

The plums proper range from south Florida to the Arctic circle, and are divided by botanists into four or more species, namely: *Prunus Americana*, found in nearly every portion of the country; *Prunus Chicasa*, generally confined to the Mississippi valley; *Prunus Maratima*, peculiar to the sea coast south and east; and *Prunus Umbelata*, generally confined to the extreme south. The student who investigates these so-called species over their entire habitat will soon find that they cannot be divided into true and distinct species; and if he gives them attention he will eventually find that they are, possibly with one exception, all one species, or can be all graded the one into the other. That they all freely cross by fertilizing each others' flowers, and that they are simply well marked climatic and geographic races ranging in size of mature plants from six inches to twenty-five feet in height. Europe and Asia have given us of the Almond family the cultivated and wild plums of those continents; also the peach, almond, apricot, and cherry. These are all quite near to our wild plums, for they all freely interbud and graft on them. And we know that some of the most distinct species cross sexually and produce hybrids with them.

For the present we will follow the classification of the native plums, as given in our text books of Botany; but I will here warn the student that it will be impossible for him to refer many of these varieties to any of the species therein given, and that if he studies them comprehensively he will find many groups and races showing as good or better distinct species than those given in the text books.

A word of explanation will help us greatly to a full understanding of this point. We will say that the student visits the Mississippi valley, between the lower Arkansas and Red river, there to study the Chickasaw species of plums. He will there find it a small tree, ten to twenty-five feet in height, with fruit of all sizes from that of a cherry to a hen's egg, with every color from yellowish white to yellow, pink or scarlet to darkest crimson, and ripening from early in May to September.

Then if he should search in the ravines of the higher plains of Colorado, he will find a little dwarf shrub six inches to a foot in height, perhaps loaded with edible fruit as large and good as the average of that in the valley, but more nearly constant in size, color

and time of ripening. At these two points we have found seemingly two very different things or species of plums. But, if the student starts from the Chickasaw Bluffs, opposite the mouth of the Arkansas river, and follows the so-called *Prunus Chicasa* up the valley of the Arkansas river, he will find the tree of that species continually decreasing in size. Where this river enters Kansas, his plum tree is a shrub three to five feet high; where it leaves Kansas, one to two feet, and then in the centre of the great Colorado plain, the little dwarf thing before spoken of six to twelve inches in height, when he will have before him what Botanists have called *Prunus Pumila*, or the Sand plum of the plains. Yet the two are one and the same species, and the Sand plum is the remote ancestor of the Chickasaw plum. The seeds of the Sand plum were carried down by the two great rivers, the Red and Arkansas, into the valley with its rich soil, longer summers, warmer climate and humid air, and after many generations the result is as we now find it. In the same way can we trace the *Prunus Americana* up the Missouri river, until it runs it into the dwarf Sand Cherry of the North; and by a study of these two dwarf forms, between Montana and New Mexico, he might be able to find and raise a dozen distinct forms up to the grade of species. So we also find all the so-called species differing widely in their different habitats, and all gradually and perfectly grading the one into the other at places where they intermingle; but nevertheless, we will find true types of all the species where they are all growing together.

With the two most prominent species the only marked specific difference seems to be that *Prunus Chicasa* is not found indigenous north of Illinois. But the other, *Prunus Americana*, seems to cover nearly the whole continent. These two species seem to reach their highest excellence in fruits, as found wild, the last named in Wisconsin and Northern Iowa, and the former in Tennessee and adjoining states. With these two species this paper has to do. Of the other species we have as yet no varieties worthy of cultivation, though *Prunus umbelata* is said to give delicious fruit in southwestern Texas. Basset's American is an example of *Prunus Maratima*, for which we have no use. This much is necessary for somewhat of an understanding of our subject. We will now take up the practical part.

PLUMS FOR PROFIT.

We gather from the foregoing that our wild plums, in some of their species and varieties, are fruits natives of and adapted to cultivation in every part of this country and beyond, both north and south. Are

they worthy of culture? It is safe to say that the majority of persons who have planted these plums for fruit, would answer this question emphatically in the negative, that they are not; they being forced to give this answer from the result of many trials, all resulting in, perhaps, complete failures, for reasons that would be presently explained. But a few of us who have learned their needs, and have planted them rightly, either by design or accident, have found them to be very profitable, and to bear enormous crops of marketable and useful fruits nearly every year, with but very little care.

PROPAGATION.

How should they be planted to insure regular crops of fruits? In rows running north and south, with the trees four to eight feet in the row, several varieties (or even species) alternating; the more varieties the better. This is as near as we can come at it with our present knowledge. The rows should be twelve to twenty feet apart.

Why is it necessary to so plant them? Because it has been determined that very few of these plums can fertilize or pollenate their own flowers, and that they must receive pollen from some other variety or species of the Almond family, or the ovaries of the fruit will not be fertilized, but will all fall from the trees when quite small. A few of them are fertilized with their own pollen, but I have found none but what is more productive when near another variety with acceptable, potent pollen. Farther, we know that all varieties are not mutually fertile when near each other. Therefore, with our present knowledge we can only say as above, plant many varieties near together. If you were farther south we could give you a safe, simple rule, meeting all cases so far as tried, namely: Plant these plums six feet apart in the row, with every third tree of the variety known as Miner, for it seems to have pollen fertile with all and all others with it, and it is a good market plum. It is a cross between *P. Americana* and *P. Chicasa*, but as it is not hardy with you, you will have to plant by the general rule given and experiment for yourselves.

None of the Chickasaw plums are fully fertile on my place with their own pollen, or with that of other varieties of the species; therefore seeds produced on these, when fertilized by pollen of Miner or any variety of *P. Americana*, are hybrids or crosses, and from such seed I have, and you may all expect our best new plums.

The Wild Goose plum, in its peculiar characteristics, shows good proofs of being a hybrid between the Chickasaw and the peach; and

so far I have found no pollen that will render it fully fruitful except that of the Miner. It is partially fruitful with nearly all members of the Almond family. Many trees of it, old enough to bear fruit for the past ten to twenty years, entirely isolated from other members of the Almond family, have never produced fruit.

FERTILIZATION.

That we will eventually gain new and valuable hybrids, between nearly all the species of the Almond family I have no doubt. In fact, we have many such now, these peculiarities of the Wild Goose and other varieties are given here to prevent mistakes, for we might cast aside a most valuable thing that seemed entirely barren, but which if given a consort with acceptable pollen might be of the greatest value, and an important point which we must bear in mind when sending out any new plums we may gain from seed, or find in the woods, is this. I know that these plums (and many other fruits also) are sometimes changed radically, often in all their characteristics, by the pollen their flowers are fertilized with. That is to say: a plum that is not fertile with its own pollen, may give very choice fruit with the pollen of one variety and very poor with that of another. So plainly has this been shown on my place that I now fear to send out any of my new plums, until I have fruited them in a different environment.

And this fact explains why so many native plums that have been sent out, went up like a rocket in glory for a time, but eventually came down like a stick. They either have no fruit or very poor fruit when their location was changed. It is probable that a smile of incredulity may be spreading over the faces of this audience at this remark, but my friends I am giving you *facts* not fiction. Pollen has a powerful influence over the fruit and all its appurtenances at times, and I am confident that it has over the whole vitality of the tree or plant in some cases. You are not astonished at your corn mixing in the grain, when one very distinct variety is fertilized by the pollen of an other, nor with the members of the gourd family (*Cucurbitacea*) especially the watermelons. It is even claimed, and correctly I think, that two varieties of potatoes will have their tubers changed by pollen when grown side by side; such instances are, of course, the exception instead of the rule. Many other plants show such effects of pollen.

I have often seen and carefully studied complete changes in apples from this cause. In fact pollenization, hybridism, and the crossing of

varieties and species are *the great* studies of the future now barely commenced.

MARKETING.

Are these plums profitable as a market fruit? Growing fruit for market has been my principal business in North Central Illinois for forty-five years, all the fruits that could be grown in that region, and I have found no fruit that will nearly approach these plums in net cash returns, for the amount of ground occupied and care given.

They sell everywhere readily. Our little town of 2,000 people absorbs 300 bushels a year at from \$2 to \$4 per bushel. Other large producers give the same report. One firm in northern Indiana reports sales of 2000 one-half bushel cases of Wild Goose plums, the past season at from \$1 to \$1.75 per case. When we consider the fact that these plums range in quality from those utterly worthless for any purpose, to large, lucious, most beautiful fruits, two or more inches in diameter, and ripening from June 20th until October, it is, of course found that value is dependent on variety. Nor is it true that the variety most profitable for market, is the one of the most value for home use. Miner and Wild Goose are the largest and handsomest of the older varieties that are passably good. They have a market value because they have been cultivated for many years and have become known, yet as fruits for home use, compared with others, they are very poor. The two best native plums for all home uses, that I have seen, are so inferior in looks that they would hardly be sold at any price in the open city market. Yet these two plums are so fine as to compare favorably with the best California apricots when canned and both placed on the same table, on a test of quality by fruit growers. They are both pure northern plums, free-stone, with very thin skins, and no bitterness; I shall not name them for there are no trees of them now to be had. I only give these facts to show what we may expect from these plums in the future. For one, I am convinced that they will prove our most valuable fruit for the Northwest, and of great value throughout the country.

VARIETIES.

What varieties should we plant? To this question I can give you Minnesota planters but very little advice of value. You must experiment yet for many years. All I can now say is, for you to plant of all the Northwestern varieties that you may deem worthy of trial, by hearsay or otherwise, such as DeSoto, Weaver, Wolf, Spear, Rolling-stone, Pottawattamie, Forest Garden, Hawkeye, etc., etc. Hunt for good ones in the woods, plant seeds, get trees from Manitoba; a friend

says he found fine ones there in the woods. Top-graft the Chickasaws on the branches of the free-growing, hardy Northern plums. Get the "sand plums" and "sand cherries" from the West, and plant all near together, all mixed up. The Newman and perhaps Mariana seem to be the hardiest of the Chickasaws; they and possibly the Robinson, and I think the Miner, should be grafted in the branches of Rollingstone and Weaver.

THE CURCULIO.

Do not fear the plum curculio (*Conotrachelus neumphar*), for this insect has no practical effect on the fruit crop of these plums whatever. The twenty years of my experience with them shows this conclusively, and I will give it to you in a few words. This insect seems to prefer these plums as a food plant, and to lay her eggs in its fruits above all other plants, for the very good reason that they have through all time been her natural food plant. By most careful study I have found the facts as follows: (1) The plum curculio seeks the native plums the first warm days of spring for food, and reaches them generally before they bloom. (2) The curculio can at that time be very generally destroyed by spraying the trees just before the blossoms open and a week later they have fallen with the arsenical poisons, Paris green and London purple, as the insect is at that time feeding freely on the young growth of the tree. I give this plan, not to protect the plums, but as a means of a general destruction of this most injurious insect to other fruits. I have found no necessity for protecting any of these plums from the curculio. (3) If the curculio is even so plenty as to lay from one to twenty eggs in every plum, my experience has been that if the plums have been fully fertilized the trees will mature a full crop of marketable and useful fruit. (4) For but very few of her eggs laid in these plums hatch, and still fewer of her young, or larvæ, reach maturity. My estimates here, during four years of careful observation, proves that it takes more than 3,000 eggs laid in any of the over 3,000 varieties of native plums in fruit on my place, to produce one well matured curculio grub, except in the variety known as Wild Goose; and even in it not near enough mature to keep up the species, not more than one grub to each six hundred eggs laid. Therefore, as each curculio averages only one hundred eggs, then even if confined to this plum for breeding purposes the insect would eventually disappear. All of this is fully proven by experience with me. For, since my first great crop five years ago, nearly every plum which showed from one to twenty ovipositing

marks of the curculio, each succeeding crop has shown a marked decrease in the numbers of the insect, the last crop being practically free from her ovipositing marks, and showing by careful estimate a decrease in the five years of ninety-eight per cent, and this without anything whatever being done to destroy the insect or to protect the fruit from her. (5) These facts prove, I think, that a large amount of these plums in fruit will free a neighborhood of this most pernicious insect; that the fruiting of these plums alone in quantity will do it, and in that way deliver all our other fruits from its ravages. And, besides, we have absolute experimental proof that spraying the plum trees, as before mentioned, will protect the other fruits near by.

Propagation.—For the North, all the native plums should be on their own roots, or those of other fully hardy plums of the North. The “sand plums” and “sand cherries” of the West may prove useful. Your cherries should be top-grafted on these hardy plums.

Soil and Experience.—These plums are partial to a deep, rich, moist soil; near the base of a hill is a choice place for them, though they do finely on any reasonably good soil; but, if possible, should have a location somewhat sheltered from the strong winds of spring. This bush, in all its hardy varieties, you will find a most excellent windbreak for shelter. Many are planting them for that purpose. They fruit finely when growing very thickly.

P. S. Since writing the above, I have received a letter from Dr. C. V. Riley, Chief of the U. S. Entomological Division of the Department of Agriculture, Washington, D. C., in which he makes certain admissions and explanations, that settles for the time all questions in dispute, and I forward him my answer to his criticism on my paper. In the position that Dr. Riley sustains before the whole American people, he is obliged to be very communicative on new questions of fact, and knowing him intimately for twenty-five years, and having not the least doubt of my facts, I have no hesitation in placing the whole matter in his able hands for future adjustment. For the grower of stone-fruits a new era has dawned.



The next on the program was a paper by Mr. Barrett.

BENEFITS OF FORESTS.

By J. O. Barrett, Browns Valley.

As a guide to right conclusions, let us for a moment consider Nature's law of equilibrium between the animal and vegetable creations. The animal breathes out carbonic acid, mixture of oxygen and carbon; under the intervention of solar rays, separating and purifying the compound, the animal appropriates the oxygen and the plant appropriates the carbonaceous portion. Thus the two great divisions of nature reciprocally support each other. Obviously, then, that country is safest to live in and promises the surest profits for industry, where, other things being equal, the animal and vegetable creations mutually balance each other. It is no doubt true that our atmosphere holds its gasses in certain specific proportions over the entire surface of the earth, but it is also true that soils, forests, water and the configurations of a country effect the chemical condition of the atmosphere, that some localities may generate more of one kind of acid than another. For instance, where there is a large quantity of decaying vegetable matter, or gaseous fissures at or in bog lands, the immediate atmosphere will be unduly charged with carbonaceous gasses. Another fact is patent, that even in localities where the acids are in chemical balance, volume with volume, or weight with weight, they cannot be appropriated for the objects desired unless their quality is adaptable. Let me make this plain:

CHEMICALLY CONSIDERED.

Here is an acre of ground amply manured. It exhales at least one hundred and fifty cubic feet of carbonic acid every twenty-four hours. Are we yet sure chemical conditions are all right for a successful crop? If the raw material of the soil, such as lime, selicia, iron, magnesia, soda, is crude and non-vitalized; if the manure is "fire fanged," neutralizing its ammonial properties; if the genuine excrement is heavily mixed with wild, dry grasses, retarding decay, the crop will be a comparative failure. The nitrogen in such a manure pile, or in the fertilizer you buy for a soil dressing, may not be any better than a stone to feed a crop. Success hinges upon *quality* in the *quantity*. The primary elements of the original rocks, composing the constituents of the soil, must first undergo innumerable triturations and transposi-

tions, climbing the several steps of progress through nature's chemical crucibles, ere they can be nutritiously appropriated by the higher organisms of our culture. Fitness to selection after nature by our arts applied has passed the primaries through the necessary evolutionary processes. This is the order of assimilation and growth. Here is where our chemistry fails us; why its analysis of our soils proves little or nothing in *vital* economy. Nature mixed her waters and atmospheres, bone and develops her children in ways that confound all our boasted wisdom. Why is lime from the bones of animals far better fitted for agricultural purposes than lime direct from the rock? Why is scientific butter from the cream of the cow ninety-nine per cent better than oleomargarine from the chemist's greasy vat? Why are ashes from hard woods better than ashes from anthracite coal that was a coarse-grained forest about a million or more years ago? Why must the delicate rose have a peculiarly fine soil to warrant a blooming that enchants the very air? Ask the divinity in nature. The answer ever returns that success comes by adapting the laws and forces of nature to the instinctive needs of all living dependencies. For plants to grow well and harvest bountifully, for horses to be healthful and spirited, for cows to give rich milk, for any domestic animal to thrive on our lands with profit, for the angels of the household to be developed strong in body and mind, they all must be protected and have food of adaptable quality.

The decayed remains of trees generate acids far more potent than those of grasses that largely form the *humus* of unforested soil. As a test, apply the ashes of wood and the ashes of straw or hay to your crops. The difference is very marked. The ashes of different species and varieties are equally marked. To make substantial soap, the housewife wants the ashes of hard wood; soft wood does not produce the requisite strength and quality of potash. What will make good soap will make good crops. Where hard woods grow, and their decay becomes a cardinal constituent of the soil, is considered the most promising place for fruit plants. Are we of the prairie lands prepared for the hard woods? Our soil may not yet be fitted. The nut-bearing trees, such as the hickory, the walnut, the butternut, the white oak, are waiting their turn for trial. Meanwhile we must pave the way with the native trees of the new Northwest, such as the box elder, the ash, the cottonwood, the basswood, the willow, the elm, the pine, the balsam, the spruce.

As the digestive organs of the body develop food into blood, thence nerve and brain, so do the roots of the trees sip up the decomposing

salts, where they are embedded into their electro-chemical batteries that transform them into new structure, building life-cells, lifting higher its lung-leaves and blossoms that draw from and exhale upon the air nitrogen, oxygen and inter-linking carbonic acid. These with hydrogen and other gases are constantly generating, acting and reacting in nature's chemical laboratories, and by election and selection are ever passing through processes eluding our arts, to be fitted for construction in new forms of life. Take, for instance, nitrogen that enters largely into the constituency of plants; one of them is ammonia, and ammonia is a product of the decay of manures and other fermenting and putrifying substances. But how nauseating and sickening are these gases when just arising from the rotten garbage! When the plant roots have found the filthy stuff and carried its supporting acids upward, reconstructed, refined, vitalized, sun-fused and electrified, a bloom with fragrance and beauty, they are the same gases, but how changed, how inspiring to all sentient things! Now the higher organic creation can breathe such air and live. Thus trees not only fit the oxydizing salts in the soil, and thence their gases, for life-support, but serve to neutralize the breeding of malarious atmospheres.

DANGEROUS DISEASES.

Our State Boards of Health over all the country, maintain that Diphtheria, Scarletina, and other germ diseases are traceable to bad sewerage, barnyard washings in the water, and other unclean environment; and they recommend better drainage and the burning of all possible putrefactions in the way. It is wise, but what health committee or legislation enforces nature's tree-hygiene? The more roots we can get into decaying matter, the safer for all things that live. Cattle men are studying how to eradicate pluro-pneumonia from their herds. Kill them off is the order; but this does not remove the cause. So long as they feed around malarial sloughs, on treeless plains swept by poisoned simoons, compelled to drink water full of deadly miasma and breathe feted air, subject to excessive heat or chill, microbic germs, latent in their organism, or imbibed by their surroundings, will be quickened into activity, preying upon their lungs and introducing consumption among the people. More forests for the herding cattle and colts with ample drainage of vacterian pools—this should be and must be the governmental order everywhere enforced. To neglect this duty is the unpardonable sin of agriculture. To procrastinate is the robbery of soil and atmospheric nutriment. To

plant no trees and cleanse no "augean stables," is to invite epidemics, then slay our herds and our children. Would there were trumpets of tension loud enough to thunder into some men's ears like an earthquake, and wake them up to a proper sense even of their own weal and happiness.

PRAIRIE PICTURES.

Go west, not farther than the Dakota border, and observe the pitiful dearth of forests on the prairie farms. Scarcely a field, or a pasture, or a barn, or a house is properly environed with trees. Indeed, on some farms not a single tree, or vine, or fruit plant, or cultivated flower can be found. The owner proposes to get rich raising wheat while head over heels in debt, and that continually. There is such a destitution of trees to demark the highways it is most perilous to venture out on a journey over the prairie in winter lest of a sudden a blinding blizzard stab with white daggers. The prairie emptiness when frozen up and down; the prairie dreariness amid wolfish howls of wind, iced in every breath, does make the settler long for the forested East or South whence he came.

We of the farther west are living in the great continental wind-trough that stretches from the plains of Texas to the Saskatchewan, from Eastern Kansas and Nebraska and Western Iowa along the western trails of the Big Woods in Minnesota to the foothills of the Rockies—a trough practically two thousand miles long and five hundred miles wide—territory enough for fifty millions more of people. True, there are belts of forests along the windings of the rivers, and under the enforcement of the timber culture act and the praiseworthy efforts of intelligent homesteaders, here and there is a forest; but in the main this vast extent is the sport and prey of remorseless winds that sweep unchecked from the frozen pole or from the tropic furnace, blasting in winter, blighting in summer; all men and beasts are strung on wire nerves through and through and all over. And don't we have to fight our way against oceans of weeds and devouring insects? against snow-blizzards that stuff a fellow full of borean wrath? against dust-blizzards that fill eyes, ears, nose, mouth and the entire epidermis with dirt and dinge, slimed on in the sweat of labor, till we look like so many resurrected mummies haunting the prairies in familiar companionship with the impudent gopher and jackrabbit?

FERTILITY AND FATALITY.

Our state geologists tell us the force of the winds are two times

greater on the open west than on the east side of our Big Woods; and that cold air in motion extracts heat proportional to its velocity, and with the heat goes moisture. According to this, if the ratio holds, during cold winds, heat and moisture pass off twice more rapidly on the open prairies west of the Big Woods than on the east. Would it not be a defensible scheme to extend the local advantage of the east side over all the western domain by forestry?

Everyone who has lived on the treeless prairie knows that snow, so essential to the protection of our plants and preparation of the soil for next year's crops, cannot long remain there on a level as on woodlands. It may be moist when it falls, but when a cold wind rolls its æreal wheels over, it soon laps up the moisture, and in a few hours cultivated fields are barren again as if swept by a thousand new brooms. With great struggle the fibrils send up their moisture to supply the depleted parts, but this, too, takes wing, and the plants are ruined by "winter seasoning." When the mercury is twenty or thirty degrees below zero, the air chilled to a dead lock, if properly clothed, you can endure the temperature quite comfortably, far more so than when the mercury is ten degrees above, and the wind plays a mad-cap race on the prairie. If you want to cool off a fretful sweat, stand at the northwest corner of your house just fifteen minutes, while old Boreas blows his horn. The experiment will give you some idea of the peril our stock and plants are in when thus exposed. In the summer season, on the open prairie, during the more chilly hours, you can actually see the moisture of the cultivated grounds drifting away on the air waves. At the right angle of observation there looms up to view humid strata, trembling, undulating in the wind, rushing on and on like the sea when vexed with storm. But the charm of it all soon fades into disappointment, when you reflect that the wind is thus savagely bleeding our early crops. Some of our most destructive winds in summer are from the south, almost burning up the very breath, and everything wilts as if touched with fiery flames. Hence, the necessity of forest belts at that point of compass, and elsewhere in the lines of prevailing winds.

WOFUL WASTE

From ten to fifteen per cent of our crops are annually destroyed by winds. The blossoms of wheat, corn, oats, potatoes, beans, apple and small fruit plants are thereby largely robbed of their fertilizing properties, and the harvest is therefore thin and scattering. Sometimes the ground covering to the cereals is swept off and piled up in dirt-ridges, as was the case last spring on thousands of acres.

Did you ever attempt to raise strawberries extensively on the open prairie? After a good enrichment of manure and cultivation, they branch out strong and prolific in July, and they do look so promising for a crop next year; but, of a sudden, comes a wind in saucy frolic, that rips up the half developed roots, twisting and driving them into clumps, poor, forlorn things! Despite the ruin wrought a few take root again, and again the cultivator does its work; and when the ground freezes for winter (following the rules laid down by Eastern horticulturists who may never have seen a prairie, presuming their methods are applicable to all localities), you throw on four or five inches of straw, and say confidently, "lie still, my darlings, safe from harm!" but sometime in March, or earlier, a genuine snorter from the northwest, or other point of compass, pries under the straw and rolls it up into heaps, smothering to death the plants underneath and leaving the rest out in the cold, to frost, heave and dry up. Courage, man! some are alive next spring; how tenderly you foster the brave starvelings destined to be robbed of nearly all the pollen they can produce! But the berries—they are like little child angel visits, few and far between; but enough to warrant the honest report—"We can raise strawberries on the open prairie at a cost of fifty cents a quart—fact!" But, for all that, strawberries and other small fruits, including some of the hardy apples, can in time be made a success, if, lessening no energy in the fruit line, we haste to develop forest belts, evergreens especially, safely enclosing our precious charges at proper distances.

A plea, too, for our stock that suffer so for want of trees. Finding no cooling shade, how the cows madden in midsummer, besieged by flies sucking out their life-blood! How the beautiful colts, finding no thicket to escape into, dash along the barbed wire fences, slitting up their ears, tearing open their breasts, maiming themselves perhaps for life! Such a fence is the most devilish thing ever made; but has the farmer a just reason to curse the inventor, while the injury to his stock may be mainly due to a famine of trees in his pasture? Nothing creates such a reign of peace among stock as trees. Reposing under their green arches, the cattle there chew their cuds in sweet satisfaction. The horses there huddle together, their heads resting upon each other's necks half asleep, and near by the sheep with their noses close to the ground to sniff the coolest air. How well they appreciate their master by good behavior!

It is problematical whether, in the long run, thoroughbreds can retain and transmit their superior points and qualities, pastured and fed

in a treeless country. Environment develop corresponding attributes in everything else; why not in stock? Some of us settlers, known in the East for our Christianly mild disposition, have, strangely to relate become ill-tempered, living on the treeless prairie. Like man, like horse or dog, your answer.

Our business, too, will materially suffer, and that very soon, unless we early and promptly attend to forestry. We are fast depleting the valuable timber. Whereshall we get our supply in the future for fuel and manufacturing? What are we doing to compensate for the loss? Doing? Why, cutting and slashing where there is anything of the kind left, with a vandalism more implacably avaricious than ever characterized the feudal ages. By mathematical measurement it is found that our Minnesota river drainage has an area of 19,000 square miles, nearly destitute of forests; the upper Mississippi drainage is about 23,000 square miles, mostly forested; thus the Mississippi has about a quarter more drainage than the Minnesota, and yet at the confluence of these rivers near St. Paul the Mississippi gives us seven times more water than its competitor. There can be no other cause for this disparity than the water ratio between a treeless and a forested country.

The Minnesota is largely fed by springs from the Coteaux in Dakota near the western boundary of our State, a mountainous rampart stretching nearly north and south about seventy-five miles. These springs flow down numerous ravines wherein long, zigzag forests, have been growing for centuries. In keeping with the marauding instincts of the whites the Sisseton Indians are using up the great trees for wood to sell in our markets. Are they blamable? You would not think so were you to inspect their condition. Something should be speedily done by Congress to preserve these forests, and thereby preserve intact the headwaters of the Minnesota, whose valley cannot be excelled for richness and for business that leans dependently upon the river for refreshment to crops and force to manufactures.

The same depredation, on a larger scale, is going on around the sources of the Mississippi—fast slaying and burning the forests. If not soon arrested, the whole climate of the State and contiguous states will be colder and drier, irreparably damaging agriculture and all its correlative branches of industry. Not only such calamities will follow, but the whole country along the river channels will be subject more than ever to great floods, spreading ruin in their march to the south.

POINTS TO PONDER.

Not only do forests trap the snows and rains, holding back the spring floods, but, by their shading leaves and limbs, they check excessive evaporation, thus husbanding moisture for more equable and economical distribution and increasing the precipitation, which in Minnesota is but twenty-eight inches. Not only do they serve as media that connect the minerals of the soil with the gases of the atmosphere to fit them for appropriation by the higher organisms, largely neutralize the breeding and ravages of germ diseases, protect our rivers and lakes from drying up, break the force of destructive winds and shelter our State and homes, but they invite hither the furry animals to people again the woody retreats, and insect-devouring birds that save our crops to a large extent from the depredations of parasites on all our plants in field and garden; they conduct electricity between the air and ground, and quicken all living things into new vigor; they furnish healthful acids and fragrances for man and beast; they spread their humid mantles over us, warming the landscape in winter, cooling it in summer; they check the escapement of heat at night and send it back to the plants safe from killing frost; they beautify all the country, evoke poetic and artistic thought, inspire lofty endeavor and nobility of character.

Summing up all these benefits, which are but a moiety of the great whole, can we in justice to ourselves and future generations postpone the matter of forestry? It is possible and practical for us to bridge over the continental wind-trough of which we spoke, with a humidity that will transform it into an Eden. As it is now, the rain-sheets from the Alleghanies and other mountained regions of the east, expend their force ere they reach us; and the rain sheets from the Pacific, winged eastward, surge against the western slopes of the Rockies, cutting off supply from that direction. Thus the richest part of North America becomes almost neutral ground, less subject to precipitation than more remote localities that have soils far inferior. Being mostly treeless prairie, the north and south winds, deflecting southerners nearly in the same direction, driving hot or cold daggers into everything, produce an excessively dry atmosphere which would speedily change our adopted country into another Sahara, were it not for porosity of soil and understrata of clay that reserve what water filtrates through to feed the roots in seasons of drouth. Under all these local disadvantages, the great enterprise of conquering a climate suggests itself. If all the provinces and states in the Red river and

Mississippi valleys from Hudson's Bay south to the Gulf of Mexico, would pull together, and with munificent appropriations reclaim by forestry all the now barren regions, constructing dams across the outlets of the innumerable spring fed ravines to hold back the surplus waters running to waste, and induce the thousands of farmers throughout the mid-continental domains to develop each ten acres of native trees; if our own State, co-operating with Dakota and Manitoba, would embank the deep basins in the far north, converting a wild and desolate expanse into great lakes over which the polar winds blowing, will bring to us vapor blessings instead of frigid curses; if Congress would early execute the late recommendation of the Commissioner of Agriculture at Washington by the construction of vast water reservoirs among the Rocky Mountains, wherewith to irrigate bountifully all the plains below, and bring to our prairie lands, laden on every breeze from these elevations, supplies of rain, and moist, and dew, and protecting snow; if all this be done with unity of force, within our century we shall have initiated a conquest over our climate, whose beneficence cannot be measured. Is not the enterprise feasible? A people that has vanquished the wolf, the savage and the great rebellion, can accomplish anything.

FORESTRY PROTECTION.

By Clarence Wedge, Albert Lea.

I understand that our Society spent much of its time at its last meeting on the subject of forestry. I wish to heartily commend its course. A very practical way of getting hardy varieties of fruit is to reduce the hardness of our climate; and when we shall have accomplished this by systematic forestry, fruit will be one of the lesser blessings following in its train.

Protecting, extending and systematizing our forests is one of the police duties the State owes to its people. We need protection from blizzards almost as much as we do from burglars. Great belts should be planted in the prairie districts, belts half a mile wide, extending through each township east and west, north and south, forming a network of barriers to our storms. Waste land, swamps and bluffs, should be given a leafy covering, and be made to contribute to the public welfare by holding the snows of winter and the rains of spring for our summer drouths.

The necessity for this work is urgent, and the benefits resulting therefrom will be universal. And when to this general and public work is added the evergreen shelter belts which every farmer should erect about his home and barns; and the rows of elms, maples and walnuts which should line our highways and avenues, we shall have completed the transformation of a snowy wilderness into the happy garden spot of the earth.

Albert Lea, March 1, 1888.

The following paper by Robert Hale, secretary and treasurer of the Minneapolis Board of Trade, was then read:

GARDENING AND FLOWERS.

By Robert Hale, Minneapolis.

Mr. President, Ladies and Gentlemen of the State Horticultural Society:

When invited by your President to prepare and read a paper upon some branch of horticulture, I was not a little astonished, as I never laid claim to a sufficient amount of knowledge of any branch of this complex science to prepare a paper that would be either interesting or instructive to an audience of practical horticulturists; but having a great love for all pertaining to the science, and in early life some practical experience in agriculture, and in the past few years in cultivating a town or city garden, I consented.

It will hardly be expected at this time, when there are so many able publications, and books treating the subject, by some of the most learned men and women of this age, who have treated all branches of agriculture and horticulture with eminent ability, that anything very new or original can be produced by an amateur.

I have read many of the works and found great pleasure in them, as well as cultivating my garden. What may therefore be expected can hardly be more than the thoughts and views of many others, commingled with some of my own personal experience.

The subject to be considered by this paper is that branch of horticulture relating to gardening, and the moral influence of flowers and the cultivation of them. The subject will be briefly treated under four (4) heads.

1. Market gardening.
2. Farmers gardens.
3. Town or city gardens, and
4. The moral influence of cultivating a garden and flowers, and of flowers.

By horticulture as a general term is understood to embrace all that part of the culture of the soil which pertains to the cultivation of fruits, vegetables, flowers and all that pertains to the ornamentation of grounds, and some adornments by means of everything growing out of the soil.

The first and most important consideration in the cultivation of any garden is the soil and location or situation.

It is of great importance that the soil be adapted to the purpose, and to receive the warmth of the sun in that part of the day between the middle of the forenoon and the middle of the afternoon.

A soil containing a large proportion of loam with a small proportion of sand, or sandy loam, with good and ample drainage, either by the natural slope of the land—or if too flat for natural drainage—under or tile drains—and with a southwestern inclination, is the best.

Heavy clayey soils are not so well adapted for garden culture, but if only such can be had, it can be greatly improved, by the application of sand, or sandy loam, in proper quantities, and with plenty of fertilizing material of the proper kind—all thoroughly incorporated by well and thorough mixing and cultivating.

The importance of thorough drainage cannot be too strongly urged—for no vegetable can grow in pools of water.

Whatever the character of the soil, or location, the best success with any crop will depend on the quantity of manure applied, which must be thoroughly mixed by cultivating, and the more thoroughly this is done the more certain will be the crop. From my own experience I feel warranted in the assertion that with plenty of manure, and the required amount of labor to incorporate them—the elements combined so that the roots of young plants may reach and take in the elements of plant life, will be certain to produce a good crop even though the season may be unfavorable. This will hold true in nine cases out of ten.

If any other requirements should seem to be needed, I should emphatically recommend frequent applications of liquid manure, and frequent stirring of the earth, or cultivation. In my own garden I use liquid manure for all flowers and a few vegetables, no matter what the condition of the soil may be—with good effect.

The last, and one of the most important considerations for good crops in any garden is that all weeds should be exterminated as soon as they appear. They are to a garden what anarchists are to enlightened society, and neither should be suffered to exist, but be eradicated—exterminated upon first appearance.

MARKET GARDENING.

In the immediate vicinity of cities and large towns, the cultivation of vegetables and small fruits for the daily supply of the market has become one of the large industries, and in our own country employs a large army of people of both sexes. In the cultivation of vegetables for market, the land should be laid out, and the rows such distance apart as admit of the largest part of the work to be done by horse cultivators; the longer the rows when so laid out, the more economical the cultivation of the crop. In this class of gardening, the owner if well versed in his business, should and will arrange for the earliest vegetables that can be grown, when followed by others throughout the season, and of some kinds, several crops may be raised on the same land. It will be of great advantage, and increase profit to the owner, to start many kinds of vegetables in hot beds, which are not expensive, and even raise them in such beds for market, before they can be grown in the open air.

Of the particular kinds of vegetables to cultivate for market, the intelligent gardener well understands, and will arrange to have them, or some of them for all seasons, and the small fruits in their season, strawberries, raspberries, blackberries, currants, etc., all of which find a ready market in their season, at good prices.

The best method of cultivating any one of the garden vegetables, or small fruits, would require an entire essay, and many have been written, and I have no doubt been read by every person in the audience, and I omit anything further on the subject.

FARMERS GARDENS.

I am aware that few farmers plant and cultivate such gardens, as they would find of great benefit and profit in cultivating, and the oft assigned reason is, other and more important farm work, want of time, etc.; when garden work is necessary to be done, such are not valid reasons. The preparation of a garden plat, plowing, manuring, etc., will require but little time, and when seeds are provided, and on hand, either raised or procured from the seedman, before the com-

mencement of farm work, but little time needs to be taken from other work to do the planting, and much of the care of it can be done by the children, and odd jobs by farm help. Every farmer's garden should be set with all the small fruits, which will require but little attention for years.

I remember reading an able article several years ago, by the late Geo. Geddes, of Syracuse, N. Y., who was one of the best writers (as well as farmers) on agricultural subjects, that I have read, in which he says, that the average farmer entirely underestimates the value of the products of a good garden, as it would supply a large part of the living of the family, and at the same time increase the health and pleasure of the whole family, workmen and all. I can fully confirm the statement, by my own experience in early life as a farmer, and later as a gardener to a small extent.

TOWN OR CITY GARDENING.

The writer cultivates a vegetable garden in this city, and has for several years, making no pretensions to scientific skill, but has been successful in obtaining a large quantity of vegetables and small fruits from a small plat of ground; all the bed vegetables—corn, potatoes, beans, squashes, tomatoes, melons, cucumbers, pie plant, horse radish, lettuce, radishes, etc., etc., with an abundance of currants and raspberries, and a much larger quantity than the family can consume. I have raised five or six crops of radishes, and the last season two crops of beans on the same land; the seed of the second was from the first crop on the same ground, and we had an abundance of string beans before the frost, and if I had planted them as early as I could, we could have had shell beans before frost. The plat of the second crop, a beautiful light green, after all the other vegetables ripened and passed, were as handsome as any portion of my flower garden. Every person understands the advantage of being able to gather from one's own garden any of the vegetables or fruits over those obtained from the green grocer, which may have remained over for days and withered, or far from being fresh. I regard the labor bestowed upon the cultivation of my garden as one of the best investments I could make; the result is very great pleasure and greatly improved health, therefore I make the most of it, and do all the work myself except cutting the grass on the lawn

MORAL INFLUENCE OF THE CULTIVATION OF FLOWERS—AND OF FLOWERS.

The cultivation of the beautiful should be the desire of everyone. Goethe's beautiful sentiment, "Cultivate the beautiful, for the useful encourages itself," is worth remembering and practicing. "Flowers," says Ruskin, "seem intended for the solace of ordinary humanity—children love them; quiet, tender, contented ordinary people love them as they grow; luxurious and disorderly people rejoice in them gathered. They are the cottager's treasure, and in the crowded town mark as with a little broken fragment of rainbow the windows of the workers in whose hearts rests the covenant of peace. To the child and girl, to the peasant and manufacturing operative, to the Grisette and the nun, the lover and the monk, they are precious always."

I have a great pity for any one who does not love flowers.

"The love of the beautiful never becomes extinct in the human soul. It may be crushed by selfishness and avarice, blurred and stained by sin and crime, but deep in every heart the latent spark remains, and needs but some purifying influence to spring it into healthy action."

"Flowers," says Pliny, "are the joys of the shrubs that bear them," and that eminent observer might have added, "and those who cultivate them."

The health and pleasure derived from the cultivation of flowers to those who love them are of the highest importance. I never pass the dwelling of a person in whose yard or window I can see but a solitary flower, but that a feeling comes to me that within is a cultivated taste, a kind and loving heart, and a happier home than where no flowers are seen.

The list of flowers I usually plant are: Geraniums, pansies, verbenas, heliotrope, rose geranium, phlox, of variety; nasturtium, feverfew and golden feverfew for borders, on account of colors; sweet allysum, balsams, foliage plants (colors), tulips, hollyhocks, peonies, lobelia, portulacca and poppies. They are planted without regard to scientific combination, but very much as wild flowers grow on the prairies or in the woods, considerably mixed.

The writer has never seen a flower, either wild or cultivated, that was not handsome; nor have I, in a long life, seen a person who loves flowers that was a bad person. Of late years I have derived more real pleasure and happiness from the cultivation of a few old-fashioned flowers than many a man with his millions.

My own pleasure is not all, for *mine* is by no means diminished, if others, strangers and neighbors, derive pleasure by seeing them.

During the past years I have had ladies call and personally thank me for the pleasure they have derived from viewing them as they passed. I have frequently seen people passing, suddenly stop, and use such expressions as "Beautiful!" "Ain't they handsome!" and others similar, and I plead guilty to a little vanity—if that is the best name—that others are pleased at the little I have done; it adds greatly to my own pleasure. Nothing has, however, given more pleasure than to see a class of persons having a taste for flowers but not the means of obtaining them come round to view mine. I allude to nurses in charge of little ones in their little carriages; and I have seen the past summer at one time five of this class apparently deriving pleasure from seeing the flowers.

I have a little neighbor, one of the finest children I ever saw, just able to walk and talk, who loves flowers as well as I do, and when he visits me he always gets a few for himself and a few more to take to his mamma, and with the sweetest smile I ever saw on the face of a child, the "thank you" he never forgets to return is to me the highest compensation that could be returned. I love that child, and all others that love flowers.

Who can measure the happiness and pleasure, not to mention the advantages to the health, to the poor and sick, who are supplied by the Flower Missions!

I am sure they are great, and hope such missions may be extended to every town and village in the land where none now exist, even if none others than wild flowers can be had. I have quite a number of very pleasant notes from friends to whom I had sent flowers when sick, and from some who were not sick, which are very gratifying. So great do I consider the refining, and, if you please, the Christianizing influence of flowers, that I would have all school children taught how to grow them; and I would have a bed in the yard of every school-house, at the cross-roads, in the village and city, as well as in the yard of every prison and reformatory institution in the land where the unfortunate are kept for the safety of society; and in every park where people go for pleasure; and in every cemetery where the remains of dear ones are deposited. Some of the latter in the East are the most beautiful places I have ever seen, and I hope the custom will become general.

At the present time, the only apparent use of life seems to be to obtain great wealth—a reasonable amount does not satisfy, and in

order to obtain it with greater rapidity than individual efforts can accomplish, "trusts" of all kind are formed, which are none other than combinations to put up prices of all articles to consumers and compel them to pay unreasonable prices—light, fuel, bread-stuff, meats and almost every article of daily consumption. Such are the causes now so often heard of the cry of oppression, and not without reason. This is a digression from the main subject, but is admissible only on the ground that a halt should be called and the rising generation educated in a different way. In my experience, with a few exceptions, any great amount of wealth is not a source of greatly increased happiness. I would, had I the power, teach the young to love the beautiful, and be satisfied with a moderate share of this world's goods.

I have recently been interested in reading some accounts of a lady of great wealth, mainly inherited by herself and husband, who has distributed hundreds of thousands of dollars, and the manner she used it, to benefit those less fortunate than herself,—the late Mrs. Astor, of N. Y. I am of the opinion the lady received more real happiness in giving than the recipients in receiving. I will read a short article taken from a late paper of that city.

"Beneath a glass case in one of the magnificently furnished rooms of the Astor mansion, at Fifth avenue and Thirty-third street, were some wax flowers and other little fancy knick-knacks. If put up at auction to be sold on their merits, the whole lot would hardly have fetched the price of a song, certainly not of a popular imported song when it first comes out. The workmanship was neither skillful nor artistic. It was exceedingly amateurish. And yet, surrounded as she was by beautiful pictures and other costly products of skill and genius, Mrs. Astor prized highly these exceedingly rudimentary attempts at art, and gave them an abiding place among her treasures.

"To a few favored friends she would explain why. They were the offerings of childish hands. They were given her by poor children, into whose lives she had brought sunshine and happiness, and lessons of goodness that might bear fruit in later years. They were voluntary offerings from the children of the Industrial School in East Fourteenth street, near Avenue B, which Mrs. Astor founded nearly twenty-five years ago, and which she watched over with loving care while she lived, although the school was under the supervision of the Children's Aid Society. Mrs. Astor loved children, and prized these humble gifts because they were mementoes of childish affection which she had won. They represented that which wealth could not purchase. Truly their presence in the Astor mansion was significant of much."

I have been informed by a person who was an intimate acquaintance of the lady, that she was passionately fond of flowers, and I imagine that, with the additional pleasure of seeing the efforts and results of children, who no doubt also loved them, and who she had aided—and who had only been able to produce very imperfect imitations—were the two causes why she gave them so conspicuous a place among her costly works of art.

Mr President, if you and your associates think this an unwarranted digression, it only proves the great mistake you made in inviting me to prepare a paper.

Finally, whatever conduces to the pleasure and happiness of the people, if useful and elevating, and which will elevate the aims and purposes of life, should be encouraged. Such, to me, is the aim of your association, and the result of the untiring labors of your Society; for the twenty-one years you have devoted to it, will be felt long after your work has been finished. I may be permitted to say, that I am well aware, in this rigorous climate, much has to be done beside cultivating the beautiful, and few can spare the time to do very much; but the example on a small scale, and by a small proportion of the people, will exert a far greater influence than many people believe. Many people, at this time wholly occupied in business affairs, apparently think it a small matter, and beneath their notice, to give time or attention to the adornment of homes. Whoever entered the parlors of a friend, where but a few old fashioned flowers are seen on the mantel, but were pleased. No marriage ceremony can be consummated without beautiful flowers; nor the last rites of burial of dear friends without them. They are beautiful at all times, and everywhere, and exert a powerful influence for good.

My eyes have never beheld a more beautiful and inspiring sight than is seen on the table in front; no artist was ever born that can equal nature; they may, and do, approach very near. The God I worship is as beautiful and lovely as the most beautiful of his works, which surround us on every hand—with no hate or revenge, but who would have all His children as good and pure and lovely as these beautiful flowers.

“ Look at the lillies, how they grow.”

’Twas thus the Savior said, and we,
E’en in the simplest flowers that blow,
God’s ever watchful care might see.

“ Shall He who paints the lillies’ leaf,
Who gives the rose its scented breath,
Love all His works, except the chief,
And leave His image, Man, to death.”

" There is not a flower can grow upon the earth
Without a flower upon the spiritual side ;
All that we see is pattern of what shall be in the mount
Related royally, and built to eteine significance."

THERE IS NOTHING SMALL.

" No lily, muffled hum of summer bee,
But finds its coupling in the springing stars,
No pebble at your feet, but proves a sphere,
No chaffinch, but implies a cherubim."

" Earth is full of Heaven,
And every common bush afire with God."

DISCUSSION.

Mr. Dartt. I wish to call attention to the blighting of fruit last season. Some ten days before blossoming time last spring we had a snow storm and frost. I examined the fruit buds after that and found the blossoms literally full of insects, that are known, I think, as thrips; they were of all sizes from a sixteenth of an inch to the merest speck. They seemed to be moving about but I did not know why they were there; and it is a question with me whether those insects did not destroy the plum crop last season. The blossoms remained a short time and then withered.

Prof. Porter. My theory in regard to the loss of the plum crop is that it was mainly caused by the dryness of the atmosphere at that season and a want of fertilization of the fruit blossoms.

Mr. Urie. Might not that condition have been avoided by spraying the trees? I knew a man in Illinois who raised large crops of plums every year, and he sprayed the trees with warm water.

Mr. Harris. The cause of the failure of the crop last year was no doubt the dry weather. Spraying of the trees might be of advantage.

Col. Stevens. There is a valuable plant growing wild on the prairies in Dakota that ought to be cultivated generally, it seems to me it is very valuable. I refer to the shrub *Shepherdia argentea*.

Mr. Gibbs. The Dakota Horticultural Society mention it as one of the wild shrubs or trees, which it recommends for general trial. It grows wild in both South and North Dakota. It is probable the seeds were brought by birds. I have it growing on my farm.

Prof. Porter. I have experienced difficulty in the germination of the seeds and would like to know how to grow it.

Mr. Sias. Mr. Benj. Bear of Eyota, a friend of mine, when coming

across the plains brought some sprouts of the buffalo berry and planted them. I was at his farm several years ago, and found his trees eight or ten feet high and literally loaded with fruit. He gave me a number of trees which I have set, and they are looking fairly well.

Prof. Porter. I shall get trees from the Sisseton reservation, as I am informed they grow there in large quantities.

Col. Stevens. I was there in an early day and did not find them. I think you will find plenty of them at Devil's Lake. They bear transplanting very well.

Mr. Sias. I planted a pint of seed and had the same trouble with them Prof. Porter speaks of.

Prof. Porter. I consider the buffalo berry one of the most promising trees we have.

Mr. Brand said, J. H. Brown, of Lac qui Parle county, had a good many other trees in his garden. He had examined them and considered them a nuisance as a hedge.

President Elliot had received a number of the plants from Fort Lincoln, three years ago, a part of which had lived, but he had doubts as to their value for a hedge.

Col. Stevens. As a hardy plant there is nothing superior. It grows at Fort Buford without sprouting out at all. It is one of the finest plants we have in the northwest for ornamental purposes and for a hedge; I am not speaking of its fruit.

Mr. Smith. Are there not two varieties? I have seen those that succored very little.

Col. Stevens. I think there are two varieties.

Mr. Urie. Chas. Hoag has them growing in North Minneapolis.

Col. Stevens. The fruit is almost equal to a currant after the frost.

Mr. Gibbs. The Shepherdie is on our list for trial. There are characteristics about it that make it very attractive. It is an ornamental plant. It is the latest tree to hold its fruit that I know of and it keeps its leaf until late, and is valuable on that account.

Mr. Smith. It bears cutting well.

Mr. Gibbs. Yes, and it is almost independent of drouth and bears abundantly; one of those plants adapted to a dry country. It seems to be at home in the arid regions of Dakota; where the annual rainfall is less than twelve inches. For an ornamental hedge it must be desirable. The fruit is good but it takes quite a time to fill a box with them. The flavor is similar to that of the cranberry; it makes nice jelly. If any of the horticultural experiment stations in this State

want specimens of the plants for trial I shall be glad to supply them.

Prof. Porter. I shall be glad to give you an order and to pay for all expenses, as I am exceedingly anxious to propagate it. I have not had success in making the seeds grow.

Mr. Pearce. Plant them in the fall under a board and I think they will grow.

Prof. Porter. I planted seeds a year ago in October.

Mr. Harris. They may come next spring. I planted some plum pits that failed to grow the first year.

Prof. Schotzka. Mr. Chairman, nature teaches us that these berries remain on this shrub during the winter; if allowed to remain till spring and then planted when they are ready to drop they will grow more readily. The same holds good with cranberries. The seed will germinate five days sooner than if picked when they first ripen. One thing I wish to mention in regard to the larch being hardy. When it stands alone it is the hardiest. Norway Spruce is the hardiest when the trees are grown close together. A larch twelve years old is worthless for fence posts; the wood is spongy. We have to ripen the wood and then it is valuable for any purpose.

Mr. Pearce. Is the larch good for posts?

Prof. Schotzka. It is just as good as any other wood, except red cedar and locust, which are the most durable of any timber we have for posts.

Mr. Pearce. How long will it last?

Prof. Schotzka. It lasts fifteen years. Where the area in timber is limited there should be greater economy used with wood and timber. Posts may be preserved, and will last twice as long if they are charcoaled.

Mr. Fuller, from the committee on the president's address, presented the following report, which was adopted:

REPORT ON PRESIDENT'S ADDRESS.

The committee on the president's address would call the attention of the Society to the following recommendations:

1. We recommend that the committee on legislation continue to look after the tree law and secure any amendments found desirable.
2. That the same committee, or a new one be appointed, to secure an efficient law to protect our State from the depredations of the incoming English sparrow.
3. That the same committee, in connection with the forest tree

committee, also secure the best law possible to secure the forests of our State.

4. That the culture of small fruits be urged on all our people, in country and village, and that amateurs use only the old and well known varieties.

5. That the dissemination of information in regard to fruit growing and tree planting is very desirable, and that the press, and especially the platform of the farmers' institutes, should be used for this purpose.

G. W. FULLER,
J. S. HARRIS,
A. W. LATHAM,
Committee.

The report of the committee on legislation being called for, Prof. Porter said there was nothing special to report that had not been pretty well ventilated during the present session. A larger number of copies of the transactions of the Society should be printed, and more of them should be bound in cloth. He wished to emphasize what the Secretary had said on this subject in his annual report. It was better to have fewer copies printed, if need be, and have more bound volumes.

Col. Stevens, from the committee on final resolutions, presented the following which was adopted:

FRUIT RESOLUTIONS.

The committee on resolutions would respectfully report:

That we desire to thank the citizens of Minneapolis, for their hospitality during the session of the Society. We also desire to thank all of the railroads that reduced their regular rates for the transportation of the members of the Society in attendance at the annual meeting.

The committee would also recommend the continuance of the committee on seedlings and fruits for another year.

Mr. Smith moved that the question as to the publication of the prize essays be referred to the committee on publications.

Col. Stevens. Would it not be better to print all of them?

Mr. Pearce. I think not; to print those that received the prize will be sufficient.

The motion of Mr. Smith was carried.

Mr. Pearce extended an invitation to the Society to hold its summer meeting at Lakeside Nursery, near Lake Minnetonka, and promised

to see that ample accommodations were afforded to members of the Society in attendance.

Secretary Hillman called attention to the meeting of the American Horticultural Society in California.

Mr. Harris said he understood J. T. Grimes would represent this Society at the session held at San Jose. He moved that President Elliot be requested to act as a delegate if possible to do so at the session to be held at Riverside, in February.

The motion was adopted.

On motion of Mr. Pearce the Executive Committee were authorized to appoint delegates to horticultural meetings.

Mr. Harris moved that the salary of the Secretary for the ensuing year be fixed at \$500; of the President, \$25; of the Treasurer, \$25; of the Librarian, \$10; that the Vice-Presidents be allowed their traveling expenses on making a report for their several districts; that members of the Executive Committee be allowed mileage or traveling expenses when necessarily called together. Adopted.

On motion, Messrs. Harris, Sias and Wilcox were named as a committee to make and present at the next annual meeting a catalogue on fruit.

On motion of Mr. Smith the meeting adjourned *sine die*.



SECRETARY'S PORTFOLIO.

DEFERRED PAPERS, REPORTS, NOTES, EXTRACTS, ETC.

INTRODUCTORY NOTE BY THE SECRETARY.

We are much pleased with the high order of the essays, papers and other contributions which appear in this report. A great variety of subjects are thoughtfully considered, evincing an awakened and lively interest in the cause of horticulture, as well as kindred topics.

Garfield, the model secretary of the Michigan state society, says: "I earnestly believe there is no occupation in the world that may be made so delightful and captivating as horticulture." This is a proposition he no doubt has proved to his own satisfaction by personal observation and experience, since he is both a practical horticulturist and indefatigable worker in literary fields as well; and in connection with his report he furnishes each year a valuable and interesting portfolio.

It would afford us pleasure to follow his example by gathering together some of the numerous articles, items, editorial gleanings, and the like, which may be found from time to time in leading papers and horticultural journals of the land. But as our space is limited we must give room in our reports to matters mainly of a local nature and seek from year to year as far as practicable, to furnish a faithful outline or history of horticultural progress in this State. In our report of the proceedings at our annual meeting, we have endeavored to condense to some extent in order to avoid unnecessary repetition and save sufficient space to bring the present volume within a proper limit as to size. We therefore feel compelled to limit the succeeding pages somewhat, although omitting many worthy things of real interest and value.

IN MEMORIAM.

Following is the report of Committee on Obituary:

During the past year death has taken from us William Cannon, an old and highly esteemed member of this Society. He was formerly a resident of Minnesota, but for several years past had resided at Fort Abraham Lincoln, Dakota.

PHILO WOODRUFF.

The subject of this sketch, an honored member of this Society, and one of the pioneer horticulturists of this State, died April 21, 1887. The *Faribault Republican* of April 27th, says:

"Hon. Philo Woodruff, a well known and highly respected citizen, died very suddenly of heart disease, at his home on First street in this city, on Thursday evening last. He had been in his usual health until within an hour or two of his death.

"Mr. Woodruff was born near Binghamton, Broom Co., N. Y., in April 1815. His father was a Calvinistic clergyman. The son came west to Indiana, when a young man, attended college at Crawfordsville, and while completing his education worked during vacations at carpentering and other mechanical trades. He assisted in the building of the first Presbyterian church erected in Fort Wayne, Indiana. He lived at and near St. Joseph, Mich., until 1852, when he went to California. He came to Minnesota in May, 1855, and settled on a farm in Waseca county, and was prominently identified with the early development of his county. He was a man of good education, and possessed of much general information. He represented Waseca county in the legislature in 1864, and for four years after was engaged as special examiner and appraiser of lands in the Sioux reservation. In 1856 he planted a quantity of apple seeds, from which he raised a number of fine seedling apples, which were productive for a number of years. In 1857 he sent to Washington and got some Sorghum seed; that fall he made the first syrup made in Waseca county, if not in the State. In June, 1846, at Cleveland, Ohio, he was married to

Mrs. Elizabeth A. Cable, a very esteemable widow lady, whose maiden name was Craw, and who survives him. Mr. Woodruff was a firm believer in the religious doctrines of Emanuel Swedenborg, and was very zealous in propagating them. One among the last acts of his life was the gift of a case of new church books to the Faribault Public Library."

CHARLES HOAG.

Charles Hoag died Wednesday Feb. 1, 1888, at his late residence 528 Aldrich avenue, Minneapolis, in his 80th year. The immediate cause of his death was water on the heart, but his last illness may be traced to a fall which he received while picking cherries in October.

Charles Hoag was born at Sandwich, N. H., June 29, 1808, and was educated at Wolfboro Academy and a "Friends" school in Rhode Island. At the age of 15 he commenced teaching and remained in that profession until he was 42 years of age. He was principal of a Philadelphia, Pa., grammar school thirteen years, and came from that city to Minnesota in 1852, bringing with him a cultivated taste for trees, fruits and flowers, acquired in that staid city. He took up 160 acres of land, a part of which now forms the site of the West Hotel in the city of Minneapolis. He was a member of the first council, second treasurer of the county, and superintendent of schools four years. In 1874 he removed to his farm "Diamond Lake," Richland township, and resided there until some three years since when he returned to Minneapolis. Within a few weeks after his arrival in the then frontier settlement he had the distinguished honor of giving the name Minneapolis, a combination of the Greek and Indian tongue, (literally water city) to the little hamlet of scarce a dozen actual settlers, which has in less than forty years grown to be one of the largest, busiest and most beautiful cities in the Northwest.

During the early years of the city he was a man of wealth and influence, and a recognized leader in all public improvements, but the panic of 1857, as with hundreds of others, caught him with his real estate heavily mortgaged, and he was only able to save enough from the wreck with good management to make his old age comfortable and leave his widow independent for life. Mr. Hoag was twice married. His first wife died in 1871, and two years later he married Susan F. Jewett, who with his daughter, Mrs. Charles Clark, and a brother, Levi Hoag, now living in Wright county, are his only surviving relatives.

The writer first formed his acquaintance at the State Fair at Roch-

ester in October, 1866, and became attached to him for his many virtues, generosity, hospitality and hearty co-operation in all efforts for the development of the agricultural and horticultural resources of Minnesota. He was present upon that memorable occasion Oct. 4, 1866, and took an active part in the meeting that resulted in the organization of the State Horticultural Society, then named the Minnesota Fruit Growers Association; became a member from the start, and was elected the first vice president, Col. D. A. Robertson of St. Paul having been elected the first president. At the same time he was a prominent member of the State Agricultural Society, and at the next annual meeting of that society advocated the cause of the Fruit Growers Association by offering a resolution that some means should be adopted to procure from Russia for naturalization in Minnesota, apple, pear and cherry trees. At the next annual meeting in 1867 he was re-elected vice president.

At the meeting held at Minneapolis, Oct. 1, 1868, he was elected president of the Society, which position he filled for one year with honor to himself and profit to the Society. His name also occurs among the charter members in the act of incorporation of the State Horticultural Society. At the annual meeting held at Minneapolis Jan. 16-18, 1882, he was unanimously elected a life honorary member of the Society. He attended nearly all the meetings of the Society and usually took an active part in its deliberations, and by his wise counsel and hearty co-operation in all measures that would tend to advance its interests, has endeared himself to the old pioneers who survive him.

The Committee on Obituary recommend that copies of the transactions for 1888 containing the above notice be put up in extra binding and presented to the widow, Susan F. Hoag, and the daughter, Mrs. Charles H. Clark, and the brother Levi Hoag.

The following is clipped from the *Minneapolis Tribune* :

“THE NAMED OF MINNEAPOLIS.

“There will be carried to its final rest to-day the body of a gentleman who played a leading part in the early history of Minneapolis; but who, owing to increasing age and infirmities, has for some years been in retirement, and has therefore been little known to more recent comers. We allude to Mr. Charles Hoag, or ‘Uncle Charley,’ as he was familiarly known.

“Mr. Hoag was one of the original settlers of Minneapolis, having

a claim upon which are now located some of the most valuable improvements in the city—notably the West Hotel. There were not a dozen actual settlers west of the river at the Falls of St. Anthony, now nearly forty years ago, when Mr. Hoag arrived here with his family, and within a few weeks of his advent here he had the distinguished honor of standing god-father for the new frontier settlement. Having been a school teacher in the East, he conceived the idea of combining in the name of the new settlement a word from the ancient Greek and one from the Indian tongue, hence the name, Minneapolis (water city, literally). There are one or two old settlers still living who were present as the little company of residents gathered at the christening. A multitude of names of the Smithville, Brownstown, Jonesburg order were suggested, when a ballot was ordered and taken, after an eloquent appeal by Mr. Hoag, ably seconded by Col. John H. Stevens, and the name Minneapolis was chosen on the first ballot.

“Mr. Hoag was noted far and wide for the pioneer virtues of generosity, hospitality and benevolence. His hearth and home were always open to his old friends and associates; and the hearty tones of his welcome will linger long in the memory of his intimates.”

ILLUSTRIOUS DEAD OF 1887.

Outside of the circle of our own State and Society, the death rate of men, who have had much to do with the advance of horticulture, during the last half century in Europe and America, has been more than usually great. It admonishes us, that we too who have borne the heat and burden as pioneers in our own Society, will ere long receive a summons to come up higher and join that larger society, that meets “over the river.” It is also a source of sincere gratitude, that a kind providence has spared so many of them, to ripe old age, to see the fruits of their labors. We can here only mention the names of a few, who are most widely known.

Mahler Moon, the well known nurseryman of Morrisville, Berks county, Pa., died on the twenty-fourth of January, in his seventy-third year. He was a genuine lover of flowers, and a nurseryman noted for his strict integrity.

Henry Ward Beecher died March 8th, in his seventy-fourth year. Though not a professional horticulturist, he was an earnest devotee of the art, and had much to do with the increase of horticultural taste, during the last fifty years, and thousands have been brought, through

his example and precepts, to have a pleasure in gardening they would not have known, had he never lived.

James Powell, one of the old time florists of Philadelphia, died April 17th, in his seventy-third year.

John B. Moore, whose name is familiar to grape and rose growers everywhere, died August 22d, at the age of seventy years. Few men have labored more earnestly to improve the American grape, and the variety which bears his name "Moore's Early," is a lasting monument to his memory.

Garret R. Garretson one of the great fathers of the American seed trade, died at his home in Flushing, Long Island, N. Y., August 28th, in his seventy-fourth year.

C. M. Hovey died September 2d, in his seventy-seventh year, thus closing one of the most useful lives that has ever been spent in the field of American Horticulture. As an author we find him, in 1830, contributing to the New England Farmer. In 1835 he commenced the publication of the American Gardeners Chronicle, which was the pioneer of horticultural publications on the continent. In 1837 the name was changed to Hovey's Magazine of Horticulture, and under that name it continued its influential usefulness for about thirty-four years. He was one of the oldest members of the Massachusetts Horticultural Society, and it is said, that out of five hundred members of the latter, in 1835, but five survive him.

As early as 1830 we find him exhibiting thirty varieties of strawberries. He was the originator of the old favorite Hovey's Seedling, which for thirty years, according to the records of the Massachusetts Horticultural Society, gained the first premiums against the efforts of all other kinds to take this high honor from it. Numbers of the best new plants and fruits of the last fifty years were first introduced to the public from his nurseries and seed-house in Boston, and many new seedlings of great merit originated with him. A great and good man has gone, but his good words and works remain to bless generations yet unborn.

Sarah Hoopes. This good mother of horticulture, passed away at Westchester, Pa., on the 10th of October, in her ninetieth year, before most of us were born she was famous as an amateur horticulturist. The love of trees and flowers which took such active form around the homestead on Cherry Hill Farm had an immense power for good, and it is said that to her we owe the famous nursery firm of Hoopes Brothers & Thomas.

These, and Dr. George Thomas, of Chester county, whose last words

in his eightieth year before his spirit departed to join the great band on the other side of the river were "Let us go out and plant some trees;" and Alexander Mitchell, the great railway president, of Milwaukee, who was one of the most munificent patrons of horticulture in the Northwest, are a few of the names of the departed of 1887 which are as familiar as household words to us all. Let us ever cherish their memory and profit by their example. May our words and works be such that when we are gone other generations may be able to say that the world is better for our having lived in it.

J. S. HARRIS,
C. L. SMITH,
S. D. HILLMAN,
Committee.

IOWA HORTICULTURAL SOCIETY.

The annual meeting of the Iowa State Horticultural Society, at Des Moines was well attended. President Patten, in his annual address, stated:

The society has established trial stations, offered premiums for the introduction of new and adapted varieties, and the systematic practice of crossing and hybridizing which it is advocating will be productive of great good. It is demonstrating the wisdom of critical analysis of the situation before proceeding. It is, in short, every day making horticulture more of a success.

The annual election of officers resulted as follows:

President—C. G. Patten, Charles City.
Vice President—Eugene Secor, Forest City.
Secretary—George Van Houten, Lennox.
Treasurer—H. Sthrom, Iowa City.
Custodian and Librarian—G. B. Brackett, Denmark.

WISCONSIN HORTICULTURAL SOCIETY.

The annual winter meeting of this society was held at Platteville, Wis., beginning Jan. 10, 1888.

The following list of officers was elected:

President—J. M. Smith, Green Bay.
Vice President—B. F. Adams, Madison.
Secretary—B. F. Hoxie, Eyansville.
Corresponding Secretary—A. L. Hatch, Ithica.
Treasurer—Matt Anderson, Pine Bluff.

LOCAL SOCIETIES.

The following, embracing a number of letters and valuable papers, read before local horticultural societies, are here presented, in addition to the regular reports made at the annual meeting of the Society, which elsewhere appear.

Following is a report of the Ramsey County Horticultural Society:

GERMAN AGRICULTURAL AND HORTICULTURAL SOCIETY,
OF RAMSEY COUNTY.

S. D. Hillman, Secretary, Etc.:

At your request I send you list of officers of the Ramsey County German Agricultural and Horticultural Society, to-wit:

President—H. Christoph.

Vice-President—Ch. Bunde.

Secretary—E. A. Venzke.

Financial Secretary—F. Spangenberg.

Treasurer—A. Giesmann.

Executive Committee—Ch. Bunde, A. Richter, Peter Hahn.

Society meets monthly as before stated in report last year.

Yours truly,

E. VENZKE, *Secretary.*

SOUTHWESTERN MINNESOTA HORTICULTURAL SOCIETY.

A local horticultural society was organized at Mankato April 13, 1888. Following is an account thereof from the *Daily Free Press* of April 14th:

“A meeting was held at Mr. Daniel Buck’s office yesterday to organize a local horticultural society. The following officers were elected:

President—Daniel Buck.

Vice-President—George Keenan.

Secretary—Edwin Rodgers.

Treasurer—Curtin Cooper.

“A committee was appointed to draft a constitution and by-laws. A great deal of interest was developed at the meeting and there is no doubt that the society will be of great benefit to the community. It is intended to have specialists prepare papers on various topics and read them before the meetings, to be followed by general discussions.

The meeting yesterday was devoted largely to grape culture. Mr. Buck presented a list of twenty-nine varieties with which he had had experience, and explained the excellence of each. The next meeting will be held the first Friday in May."

In its issue of May 5th the *Free Press* says:

"The recently organized horticultural society held a meeting at Mr. Daniel Buck's office yesterday afternoon and completed an organization. A constitution and by-laws was adopted. The name of the organization is 'The Southwestern Minnesota Horticultural Society.'"

The annual meeting will occur on the first Friday of October, while the next meeting will be held June 1st. Considerable interest is being displayed in this work, and it is expected that the society will attain a large membership.

MCLEOD COUNTY HORTICULTURAL SOCIETY.

The following papers were read at the annual meeting of the McLeod County Horticultural Society.

GRAPE GROWING FOR FARMERS.

By John S. Harris, La Crescent.

Mr. President and Gentlemen :

I am an ardent admirer of the grape fruit. It is a luxury that every farmer ought to be able to furnish for the use of his family in unlimited quantities. You are all familiar with its history and growing importance in this country, so that I need not take up your valuable time with pretty preliminaries and prefaces, but confine myself briefly to those methods that in my own experience have brought certain success.

I will start out with the broad assertion that good grapes can be successfully grown in many portions of Minnesota by all who select a suitable location and soil, plant the right varieties and give suitable attention to the preparation of the soil, planting and management. The best location for planting a grape vine is one that is high and airy and near lakes, rivers or other considerable bodies of water. A southern or southeastern aspect is the best for this climate, for the reason that our summers are short and the varieties we now have in cultivation require every advantage in warmth and sunshine that can be given to bring them to perfect maturity.

But few of our farmers have the lakes, rivers or other bodies of water, or even hillsides convenient at hand, therefore they should make the nearest approach to the latter condition that circumstances will permit. For setting a few vines for his own use let the farmer select the highest ground in his garden, and if it is not sheltered upon the north by a wall, fence, hedge, building or a grove of timber, let him improvise some other kind of shelter, if it be only two or three rows of plum trees.

In selecting the soil it is well to remember that a deep, warm, sandy loam, rich enough to produce a good crop of corn, and having a sub-soil that is not retentive of water, is about the best. Avoid deep, moist, mucky soils if possible, because they tend to promote a rank growth of pithy, immature wood, that is very likely to be killed by the autumn frosts, and produce fruit only of an inferior quality. If such soil must be used, let it be made as dry as possible by deep drainage and ridging. Stiff clay soils are not desirable, unless they are thoroughly drained and deeply worked. Stony ground, where there is soil enough to hold the roots, is excellent for the vine, and so rocky that it cannot well be plowed may be profitably used for growing grapes. It would be unwise to plant grape vines in the door yard by digging a hole in the sod, just large enough to receive the roots, or upon any new land until the sod had been broken up and rotted or brought into suitable condition for growing farm crops.

In the fall, before planting, the ground should be plowed or dug over as deep as the holes for planting will be made. If the land is comparatively new and reasonably good it is not best to use any fertilizers at the time of setting, or for several years afterward, unless it is vines instead of grapes that is wanted. If the soil is sandy or poor and worn out, lime, ashes, bones or the carcasses of dead animals are all useful to restore it to a normal condition.

On the farm land is usually plenty and cheap, and therefore it is good policy to give the vine plenty of room. Rows ten or twelve feet apart and the vines eight feet apart in the rows is a very good distance.

I consider the spring the best season for setting the vines, but it may be done with safety in the fall if they are well covered with mulch the following winter. Two-year-old plants grown from cuttings to a single cane and cut back to two or three eyes, or strong one-year-old layers are considered to be the best to use. In setting, dig the holes large enough to receive all the roots without cramping or crowding when spread out in a natural manner. Such plants, grown

from cuttings, have two sets of roots; let the bottom ones be spread out first, while the others are gathered up and held around the top with one hand, instead of mingling them all together. Fill good soil around and over them, making it somewhat firm; then spread out the upper set of roots and finish filling up the hole with the same kind of soil, taking pains to see that it comes in contact with every root; tramp the whole rather firmly, then draw about two inches of loose dirt over that. When finished but two eyes should remain above the ground. Some people advise deep planting. I would not dig the holes more than ten or twelve inches deep, and then if the top of the vine comes too high above the surface set them slanting enough to obviate it.

Treatment the first year.—If both eyes break and throw up canes leave but one to grow the first season, giving preference to the lower unless it is much the weakest. It is a very common practice to allow the vines to grow trailing upon the ground the first season, but it is better to train them upright to lathes or small stakes, but no pinching or summer pruning is to be tolerated more than to remove surplus canes that may start from the base. They will require frequent hoeing and cultivating about the same as corn and no weeds or grass must be allowed to grow to rob or smother the plants. At the close of the season after the leaves are fallen, say about November 1st, the vines are to be pruned, which is a very simple operation, consisting of cutting away all of the season's growth from about one inch beyond the first well developed bud above the base from which the cane started. Before extreme cold weather sets in they should receive winter protection, which is best given them by covering with dry evergreen leaves, boughs, straw, cornstalks or earth.

Treatment the second year.—The first operation after the opening of spring, is to remove the winter protection. This year two canes are allowed to grow instead of one, taking the strongest that start, one from base, the other from the opposite side of the spur that was left in pruning. All others that start are to be pulled out as soon as these have grown to a length of six or eight inches. These two canes must be tied to stakes which may be made of any small poles. When they have reached the height of about six feet they may be stopped once by pinching out the end bud (nothing more) and the ends of laterals may be pinched out after one leaf has formed, and if they start again after another good leaf has been formed, may be pinched out again beyond it, but no pinching allowed after August 1st. This practice is to insure stocky canes and well developed buds, but it should be borne in

mind that it is injurious to remove full grown leaves at any time. At no age of the vine should any summer pruning be allowed more than the pinching out of the points of the growing canes. Cutting and slashing to develop fruit buds and ripen the grapes is a humbug and injurious to both vines and fruit. Clean cultivation should be given this season and every season hereafter. Early in November of this year the vine should again be pruned. The operation consists in cutting one cane back to two buds or eyes above the base, and the other to about four feet, and winter protection should always be given.

The next spring, which is the beginning of the third season, we should decide upon some system of training. The one arm renewal is an easy and a good one and very simple, and one that at any time can be changed into some other system. A trellis may be used in this system or sufficient support may be furnished for the vines by using two upright stakes, six or seven feet long, set two feet apart, one each side of the vine. For this system the cane that was left four feet long is to be tied to the stakes in the form of a bow, and the end of the canes that grow from it, should be pinched out after six or seven leaves have formed. One cane only should be allowed to grow from the short spur, and that is perhaps better to be stopped when about six feet long and the laterals treated as before recommended. The vine may be allowed to carry some fruit this season, after this liberal crops. In the fall after the fruit is gathered, and the leaves have fallen we do our pruning, and you can readily see why it is called a renewal system. In the pruning we cut off the single cane grown from the short spur at the top of the stake, and cut away all of the other cane, which has fruited, and its branches to one inch above the lowest branch, and that back to one or to eyes above the base. The long cane is designed to bear the principle part of the fruit next year, and the spur to grow a cane for fruiting the next year following.

If the vine is strong and healthy about the fifth or sixth year we double the fruiting capacity by pruning in such a manner as to have two fruiting canes and two spurs for growing fruiting canes each year, and in some instances double again. In these cases it is essential to have a trellis and tie the fruiting canes to it in a spreading or fan shape. If we intend to adopt the fan system from the start, we prune and manage the first and second season precisely as we have recommended at the commencement of this paper, but in the fall of the second year, instead of pruning one cane back to two eyes and leaving the other about four feet, we cut both back to two eyes and grow a cane from each eye. The next fall prune each of these canes back

to two eyes. At the end of the next season we will have eight canes, each alternate one of these we prune back to a single eye, and the other four according to the strength of the vine, from two to four feet. The following year one cane is grown from each single eye spur and the long canes are allowed to produce a crop of fruit. In the fall the canes from single eyes are cut back to a suitable length, and those that have borne fruit to one inch above the lowest side branch, and that to a single eye.

The best varieties for cultivation by farmers are Moore's Early, Worden, Concord, Delaware, Brighton and Martha. If a sour grape is desired for cooking purposes, the Janesville and Clinton might be added to the list.

SKILLFUL GARDENING.

By M. T. Ridout, Lakeside.

Mr. President, Ladies and Gentlemen:

By request of your worthy president, I appear before you this afternoon to give you a little plain talk on the vegetable department of horticulture.

Experience, although many times a dear teacher, is the sure method of gaining a true knowledge of what is required to bring about the best results in our immediate locality. The United States of America in its vastness, embraces a widely varied climate and soil.

Our soil and climate are well adapted to vegetable growth, and with proper culture great size and perfection are secured. As a matter of economy, also in a sanitary point of view, more vegetables should be grown and more consumed. This everlasting bread and meat business puts many a dollar into the doctor's purse while our own becomes depleted.

Fruit and vegetables should be allowed a more prominent place on the farmer's table. They are not only conducive to health, but they tend to expand and strengthen the intellect.

I will proceed to give our method of management, which has met with tolerable success, both financially and otherwise:

Select a piece of ground as nearly level as possible. If sloping at all, let it be towards the south. Manure heavily—say seventy-five wagon loads to the acre, with composted manure. Manure from the stables is better than that taken from the yard. Let your compost heap consist of two loads taken from the horse barn to one from the

cattle sheds. So alternate until you have the desired amount. Fork over and repile as often as smoke is seen issuing from the mass. Do not neglect this, otherwise it will "fire-fang" and thus destroy its value as a fertilizer.

This composting, if properly done, will kill all the weed seeds it may contain. Apply this to your garden early in the season and plow under at a depth of eight inches. Harrow as often as any signs of weeds appear until all are subdued. Manure again at the rate of twenty-five loads to the acre and turn under as before, only put the plow down ten inches instead of eight. This prevents the liability of clogging the plow with the manure first turned under. Harrow as before until all signs of weeds disappear. This gives you a clean, rich piece of ground for a next season's operations.

Next in order is, what shall we plant? And where can we procure good, reliable seeds? And when and how is it to be done? I will answer the first question, "What shall we plant," by giving you a list of seeds all "A No. 1," that will probably fill the bill: For early cabbage, Northrup, Braslan & Goodwin's Deep Head or Peerless; for late, Marble Head, Mammoth or Flat Dutch; lettuce, Early Prize Head; cauliflower, Henderson's Early Snowball; celery, Boston Market; egg plant, Black Pekin. For early tomatoes, Canada Victor or the Conqueror; late, Turner's Hybrid; peas, American Wonder, Dwarf and Wrinkled; parsnip, Hollow Crown; carrot, Danver's; beets, Eclipse for early, Long Blood for late; sweet corn, Cory for early, Stowell's evergreen for late; cucumbers for pickling, Green Prolific; melons, Water, Cuban Queen or Mammoth Ironclad; Muskmelon, Hackensack or Nutmeg; squashes, late, Hubbard, Boston Marrow or American Turban; early, Summer Crooked; turnip, Sweet German; string beans, Golden Wax; radish, White Strasberg; asparagus, Conover's Colossal.

Growing garden seeds is separate and distinct from gardening, as the term usually implies. Amateurs had better leave the growing of their seeds to professional hands. In former years I was of the opinion that seeds grown in the northwest were inferior to seeds grown south and east of us, but I have materially changed my mind, and so have seedmen generally. The majority of seed catalogues that find their way into our homes advertise northern grown seeds. But like the old renowned Hamburg cheese, no matter where made or grown, if the name is there the article itself must be all right. For the past two or three years I have purchased my seeds of Northrup, Braslan & Goodwin Co., of Minneapolis, and I find their seeds fully as reliable as any seed firm that I ever dealt with.

SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

At the fifteenth annual session of the Olmsted County Horticultural Society held at Rochester Jan. 7, 1888, the society was merged into the new organization, entitled as above, at which time a number of letters were read and papers presented, among which were the following:

Mr. Deacon read the following letter from Mr. Wyman Elliot, President of the Minnesota Horticultural Society:

LETTER FROM MR. ELLIOT.

MINNEAPOLIS, MINN., Jan. 2, 1888.

FRIEND SIAS: Your letter of December 30th received and noted. Thank you for the invitation to attend the annual meeting of your county society. It will be impossible for me to come down, as I have much to do preparatory for the meeting of the State Horticultural Society here the seventeenth of the present month.

I hardly know what to say to you with regard to the formation of a horticultural society, the tendency of which would be to draw away from the old Minnesota State Horticultural Society or divide the working force of that Society. You know as well as I do that we need to encourage the parent society as much as possible, and if possible give it greater efficiency in its broad field of labor. My first impression on reading your letter was that it would not be a benefit to the horticultural interest of the State. Would it not be better to organize these township horticultural societies and let them be auxiliary to the county societies, and the county societies made more efficient and capable of rendering better aid to the State Society, instead of creating a sectional society that will eventually detract from and divide the work of the State Horticultural Society? I may misunderstand the idea of forming another society within our State whose object would be to divide the work, and eventually the support we receive from the State. I think we should not do anything that will divide or cause sectional sentiment to arise to the detriment of our State organization. I have worked always with the idea of some day our State Society becoming a powerful factor in the development and dissemination of horticultural literature among the masses that will give an impetus to our art, and cause every thinking tiller of the soil to have confidence in our work. Then we shall not lack the means whereby to carry on the work successfully. One strong central organization

conducted on a broad and firm foundation will do more effective work than if we divide our interests. Let that be our *State organization*, and let us all rally around it and make it more able to carry on the arduous work before us of bringing into being fruit trees that are capable of withstanding our cold and rigorous climate. Pardon me for writing as I have; I may have misconceived the idea of the formation of the Southern Minnesota Horticultural Society.

We extend to the horticulturists of your section a cordial welcome and free entertainment. Please all come and help make the State Horticultural meeting the best ever held.

Faternally yours,

WYMAN ELLIOT.

LETTER FROM MR. POND.

KASSON, Jan. 6, 1888.

Mr. Sias and Friends of the Horticultural Society :

Agreeable to request I will give you a short report of the condition of the horticultural field in Dodge county. I say, however, that my experience as a fruit grower has not been very flattering. I have set more apple trees than I have had the privilege of gathering the apples therefrom. This, I have thought, was owing to carelessness on my part, in a great measure, in not taking proper care of the trees.

For two or three years I have been watching the doings of our State Horticultural Society and have concluded that I was not altogether to blame for my trees not bringing forth fruit. I have taken some pains to learn the facts of the fruit interest here. I find there is a better showing than I expected. The Duchess apple is all right and will pay every man ten fold for its space and time given to it. The Wealthy does fairly well and should have a place in every orchard; also the crab family is doing finely and should be in every garden.

Small fruits such as strawberries and raspberries have been raised here for the past ten years in bountiful quantities, though only for home use. The Concord and Janesville grape are becoming quite plenty in their season and of very fine quality. We have now such a fine hardy class of small fruits to select from that there is really no excuse why every one should not have his table well supplied with each kind in their season. Small fruit is a staple article in all of our markets, selling by the carloads. This is as it should be, and anyone owning a half acre lot can have all he wants without price.

The statistics of Dodge county show that we have now growing forty-five hundred apple trees, and only one hundred and thirty-one grape vines. This is a poor showing for a county as well settled as this is; also a fine field for a good, reliable nurseryman to work on. Now, my friends, don't conclude from the above statement that Dodge county farmers are not a fruit loving people, for such is not the case. We have been duped by tree agents often, and still there are many of us ready to try our luck again. I have seven Duchess trees that are now about twenty-five years old. They stand about twenty-two feet high and well proportioned. They look as hardy as oaks. I have probably taken six hundred bushels of apples from them. I have a few Wealthys also that are doing very well. The spring of 1886 I planted out two acres of the Ancient Briton and Snyder blackberry. I lost some of the plants through carelessness of shipping, but the past season they have made a big growth and ripened up the canes, so if there is any show for raising this fruit here I think I stand a good chance of having blackberries to eat and to sell.

Wild plums grow here as fine as any that can be produced anywhere and in large quantities, fully up to the Rollingstone or any other native plum of the north. We have some seedling apples that have the appearance of being valuable. I am trying to induce the owners of these trees to let our experimental stations have some of the scions, but they appear to be afraid that someone will make some money out of it. I think they can be reached if the right man will undertake it.

If your society has any of the horticultural reports to spare I would like five or six to distribute here. I would be willing to pay my share of the tax to put one of these reports in the hands of every farmer in the entire State.

Yours respectfully,

C. H. POND.

LETTER FROM MR. HARRIS.

LA CRESCENT, MINN., Dec. 21, 1887.

Mr. President and Members of the Olmsted County Horticultural Society:

In looking up statistics on the horticulture of Minnesota, I find that your society was organized some fifteen years since and continues to maintain an active existence; that it is the only living horticultural society in Southern Minnesota proper, and that it is the oldest living county organization of the kind in the State. We have altogether

too few organizations of this character in our State, and the few we do have are too weak in their membership and too restricted in their field of operations. Their membership ought to comprise every intelligent citizen, whether professor, merchant, artisan or farmer, who is within reach of the meetings, and the work ought to cover every settled portion of the county or district within its corporate bounds; and I think it would add very much to the strength and usefulness of these societies if they would each start and maintain an experimental station, where everything new and unknown that is brought to public notice could be tried and tested before nursery agents were allowed to sell them to unsuspecting people. Such station would also be used for originating new varieties from seeds and for improving and ameliorating the wild fruits that are indigenous to this climate. Do not understand that I am finding fault with the work of the past, but that I am advocating new departures for the future.

Our State Horticultural Society is doing a good work, and I believe those of you who attend its meetings or have access to its annual reports will agree with me that there is not a better state society in the Northwest, if in the whole Union. It ought to have 5,000 members. It ought to be upheld and sustained by more liberal appropriations from the State, and its officers ought to be constituted a State board of horticulture, and under it should be placed the direction of the horticultural experiment work of the State station and all sub-stations within the State, and it should have the direction of the use of one-third of the amount given to our State for experimental work by the general government in the Hatch bill, that it may not be diverted from its proper use and may become of some little use to those for whose benefit it is given.

I am of the opinion that the State Society could be greatly strengthened and its sphere of usefulness enlarged through the organization of three or more district societies, regularly incorporated and recognized by State appropriations and a right to seat delegates in the conventions of the State Horticultural and Agricultural society, and a well ordered system of county societies; and I am also of the opinion that this is the opportune moment for starting the work.

Your society is old enough to throw aside swaddling clothes and come out in pants and top boots. The beautiful city of Rochester and the well ordered farms of Olmsted county show the imprint of your work. Why not broaden and enlarge your work so as to take in all Southern Minnesota? I do not mean that you should drop your county organization in order to start a greater one, but that you

should throw more life and vim into it and at the same time start a boom for the organization of a Southern Minnesota horticultural society, second only to the State Society, that may occupy the field before the next session of the State legislature. Such an organization would prove of great benefit to this portion of the State, and would lend new impetus to horticulture and rural adornment. I would have this society to hold annual meetings and exhibitions winter and summer for discussion and the display of the best products of the region. Our State is so large and many of our fruit growers live so remote from the places where meetings are held, that their attendance upon the State Society is out of the question. Many of such could and would attend the meetings of district societies, and would soon get enlisted as active workers in the cause.

At no time have the people stood so much in need of the education and information that is best imparted through association and experiment as at present. Upon the apple question we are badly at sea. Recent great drouths and unfavorable seasons have so broken up our old lists of ironclads that we are compelled to look about for something better to take their place or else throw the whole apple question overboard, and like school children, play that dolls are true babies, and Siberian crabs are apples and monstrous good. The better to put in their place offered in the recently introduced varieties from Russia and some seedlings of our own just coming to notice, are all untested as to quality, hardiness and adaptibility to Minnesota. To test these alone is of sufficient importance to warrant the organization of a score of societies and the expending of thousands in money.

Your fellow worker in horticulture,

JOHN S. HARRIS.

Following is the annual address of President Sias:

ANNUAL ADDRESS.

By A. W. Sias, Rochester.

Members of the Olmsted County Horticultural Society:

The cause of horticulture has no truer friend or trusty counsellor than the man who suggests that now is the time to "start a boom for the organization of a Southern Minnesota Horticultural Society."

That Rochester is also "historic ground," being the birthplace of

a State Society, is true as he tells us. It is also true that this was the first local horticultural society started in the State and the only one that has succeeded in maintaining an existence for any great length of time. Rochester is also historic ground as being the place where the first Farmer's Institute was organized this side of the Mississippi river, and we believe we might safely add this side of Lake Michigan. (I mention this fact because several other points have claimed the honor.) Again, Rochester is historic ground as the birthplace of the Southern Minnesota Fair Association which is far in advance of any other district organization in the State, and by widening our field of labor and drawing help and strength from the unoccupied territory outside of our county, we can greatly assist our fair association here in making far better exhibits of fruit and garden products, and so become mutual co-workers in one of the grandest of all enterprises. These being well attested facts, as regards Rochester's past history, it gives us great confidence in her ability to start the "Southern Minnesota Horticultural Society" on her way rejoicing in such a "God-speed" manner that she will never falter or turn back, and at no distant day become an honor to the place that gave her birth, and a blessing to the State at large.

One object in this new departure is to enable ourselves to render more and better service at our State Society of which we are all so justly proud. Owing to having several years start of local societies in other parts of our State, and perhaps we might add a slight advantage in regard to climatic influence, we should of right become, if we are not already, the most powerful auxiliary of the State Horticultural Society. This new departure should of necessity, providing each member acts well his part, increase the membership and result in more and better papers for the State Society.

The chief magistrate of Rochester possesses more than ordinary "horse sense," and when consulted as to the propriety of holding our annual meeting in the city hall, he most cheerfully approved of the proposition, and said he would have the council room warmed and reserved for our use on the day selected. The kind remarks made by the mayor on this occasion showed him to be a man of foresight sufficiently clear to discern the fact that Rochester could well afford to foster all such industries as the Olmsted County Horticultural Society whenever they see fit to take lodgment in her beautiful city.

The merchant can easily see that an increase of fruit and garden vegetables, both in quantity and quality, means an increase of business with him at the store and a more healthy condition of his family

at home Our noble calling has always been helpful in all the varied walks of life. Even the physicians acknowledge our aid, when we dispense sour crab apples to the little boys in early summer, although he has as little use for us as anybody, owing to the fact that the healthfulness of the country increases in proportion to our success in producing wholesome fruits.

The boot and shoe dealer can afford to speak a kind word for us, and take a ticket for a short excursion and diversion on board our beautiful craft, because he well knows that our traffic causes the young scape goats about town to wear out a large amount of extra shoe leather while stealing apples, plums, grapes and berries from our members, and that he is the only person who reaps much benefit from such malpractice.

The lawyer should have a "warm side" for us, for his services are liable to be called into requisition at any time, while trying to defend our property, which, as is well known, is the most attractive and by its nature the most exposed to the "light-fingered gentry" of any other property known to man.

The wagon maker should also encourage our traffic, for it is going to call a "heap" of wagons into use some day to haul our fruits and vegetables to market. In short, every vocation in Southern Minnesota will be directly benefitted by our occupation and the stimulant given it by your action to-day.

It is a trite saying, and as true to-day as when first spoken, that "in a multitude of counsellors there is safety," hence we have taken the trouble to advise with the leading horticulturists of the State in regard to reorganizing under the name of the Southern Minnesota Horticultural Society. E. H. S. Dartt, vice president of State Society, says: "You can count on me for membership fee and as much work as is consistent with present obligations." Every good enterprise ever yet started by mortal man has been sneered at by selfish and weak-kneed men, and we cannot expect to wholly escape criticism, but the fact that we have kept this society out of debt and in good running order for fifteen years, with all the obstacles that we have had to contend with, shows that we are not easily frightened or discouraged, and is certainly an indication at least that we are capable of occupying a wider field of action and assuming greater responsibilities. If, as someone has remarked, a "pebble when cast into the ocean on one side will create a ripple on the opposite side," then who knows but the new departure taken here to-day may create a ripple in horticultural circles that may be sensibly felt all over the Northwest. Let each member act well his own part, and the thing is done.

As this is my farewell talk to the Olmsted County Horticultural Society, perhaps we might be pardoned for taking a retrospective view, and inquire whether we have succeeded in doing anything commensurate with the time and money spent. In the first place, we claim to have done something to stimulate and encourage fruit-growing in the county. We have exhibited much fine fruit on the five hundred plates owned by us for many years past at the Southern Minnesota Fair; exhibits that have compared very favorably with the State Fair exhibits. We have annually distributed some fifty or more State horticultural reports where we believe they will do the most good, and that they will do much good no sane man for an instant doubts. Trees and flowers, as well as horticultural matters in general, have occupied the time and best thought of our greatest poets and scholars from time immemorial. See Bryant's poems: "The Death of the Flowers," "Planting the Apple Tree," "Blossom Time," by Mary E. Dodge, etc.

In conclusion, please accept my hearty thanks for the unmerited honors bestowed upon me from the organization of our society up to the present time.

INSECTS INJURIOUS TO HORTICULTURE.

By J. S. Harris, La Crescent.

Mr. President and Members of the Olmsted County Horticultural Society:

No one at the present day can expect to make a success of fruit growing without having some considerable knowledge of the numerous insects that prey upon the trees, plants and fruit. His best efforts are liable to bring only failure unless he has knowledge enough to recognize his irrepressible enemy and sagacity enough to devise some method for circumventing or destroying him.

For many years I have endeavored to awaken our people to the importance, yes, necessity of having a State entomologist appointed and paid to make investigations and impart information upon this all important subject, as it is needed by our farmers, but thus far I have not been able to awaken an interest sufficient to create a sentiment that would exert any influence upon our legislature, so they would deign to give the matter any attention. In the squabble for spoils, matters that pertain to the welfare of the producing classes are forgotten, and we are left to work out our difficult problems unaided and alone.

In the papers No. 1 and 2, read at your meeting in 1885 and '86, I have described the Apple Gouger and Codling Moth and their work upon the fruit, and suggested such remedies as are known to be beneficial. I am not egotistical enough to think that the papers have brought about any great amount of good, but I am happy to be able to report, that at my own place, and in such portions of the State as I have been able to take observations, the depredations of these two insects were much less in the last season than for many years before. I have but little time to devote to these observations and therefore cannot give positive reasons for it. It is a well known fact that when any one species becomes so numerous as to threaten the extinction of the food plants upon which they subsist, nature interferes and sends some enemy or parasite to prey upon them, and restore a balance by reducing their numbers. I will mention these causes that may have combined together to effect the decrease, viz: Drouth, birds and insect parasites. I place drouth first because the evidence proves its being sponsor for the others.

The summer of 1886 was noted for its drouth throughout the greater portion of this State and may have been favorable for the multiplying of the minute parasite insects that are here to a certain extent in all seasons, causing them to become so numerous as to keep down the injurious insects in 1887. 1886 was favorable also for the nesting of birds, but not favorable for plants or grasses in uncultivated lands, or fruits under the same conditions. There being nothing in the forests for insectivorous birds to feed upon, they were driven to the cultivated fields, orchards and gardens, about the abodes of men, and while their destruction of cultivated fruit was very great, they doubtless made up for it in a great measure by clearing our ground of the injurious insects. The summer of 1887 has been equally dry and the birds more plentiful than known before for many years. Therefore I think we may reasonably hope that some of our insect pests may not be as numerous for a year or two.

We have concluded to take for the subject of this paper, the Round Headed Apple Tree Borer, (*Saperda Candida* of *Fabr* *S. bivittata*, *Say*), an insect that is injurious to the tree rather than the fruit. There is another of the borers that is found working in our apple tree more or less, the flat headed borer (*Chrysobothris Femorata* *Fabr*) or Apple Buprestis, but I think this first the most injurious one with which the orchardist has to contend. The beetle or perfect insect is not often seen because it flies only at night, but is easily recognized from the following brief description: It is long and narrow, varying from

three-fifths to three-fourths of an inch in length, and the width across the shoulders is about one-fourth of the length. The antennae are nearly as long as the body, slender and tapering, and when at rest are thrown backward and curved outward at the ends. There are two very distinct white stripes running from the head to the tip of the wing cases, between three rather broader cinnamon brown stripes. These stripes are so well marked and distinct that they are sufficient of themselves to distinguish the species.

The beetle makes its appearance in May and June, but remains quiet and hid during the day and therefore is seldom seen except by those who search for it. In this latitude the female deposits her eggs about the last of June and first of July, one in a place upon the bark of the tree, low down on the trunk or near the ground, or sometimes in the axils of the lower limbs. From these eggs hatch in about two weeks a minute footless grub of a whitish color with a yellowish head, which eats its way directly through to the inner bark and newly forming sap-wood. For the first year of their life they feed upon the sap-wood, making paths just the size of the body in the bark and sap-wood which are filled with their sawdust-like castings. Although its operations vary somewhat, and some writers state that it works upward from the place of entrance, what few observations I have been able to make, tend to convince me that during the first season it works downward toward the root of the tree, and that it remains at the bottom of the burrow through the following winter inactive. The following spring it commences to cut a cylindrical passage upward, and when about half grown it commences gnawing through the solid wood, continuing to enlarge the size of its burrow as its body increases in size, and pushing the sawdust so made downward and outward toward the orifice made for entrance, which has been somewhat enlarged. This burrow runs slantingly inward toward the pith of the tree and then outward, terminating at the bark. It does not now continue to mine into the bark, but filling up the burrow at each end and enlarging the cavity it makes for itself a place to undergo its last transformation, and then quietly awaits its change. When fully completed it pushes back the castings into its nest, gnaws a round hole through the bark, and comes forth and prepares to propagate its species.

Our best entomologists differ about the length of time it remains in the larvæ state. Dr. Fitch says they remain in the larvæ state two years, Dr. Harris from two to three years, and Prof. Riley three years. My observations lead me to believe that they remain in the tree about two years and ten months, and inactive about five months of each

year. The larvæ is a footless grub, and when full grown about one inch or a little less in length and something over a quarter of an inch across in the broadest part. They are of a cylindrical form of the second segment, of which there are thirteen, being bulged and somewhat broader than the others. The head is small, of a chestnut brown color polished and horny. The upper jaws are deep black, sloped at their tips which are obtusely rounded. The color of the body is a pale yellowish white and the consistence is soft and fleshy. The final change to the perfect insect occurs in May or June, after which the beetle comes forth from its burrow in the night during which time only it uses its wings in going from tree to tree hunting for companions.

Remedies: A number of remedies have been suggested but none of them have been so thoroughly practised as to make much impression towards their extermination. One writer says: "The great majority of the young larvæ reach the inner bark about the first of September and all have reached it by October 1st." The first half of October is the best time to search for and destroy them. Until that time they have done but little if any damage, and their presence is readily detected by a discoloration of the bark and their excretions on the trunk of the tree. They are readily found and dispatched by shaving off the outer bark with a sharp knife. If the trees have been neglected the first year the worms will be found in their burrows and must be attacked singly. Their presence can now be readily detected by the little holes through the bark out of which fine sawdust like castings will be found adhering. They can now only be destroyed by probing the burrows with a wire or cutting them out with a pointed knife. After the grub is destroyed the wounded place should be covered with grafting wax or a cement of clay and fresh cow dung.

Probably preventives are more effective than remedies. It is said that trees that are trained low so that the branches shade the trunk, and that are healthy, thrifty growers, are less liable to their attacks than those with exposed trunks and feeble growth. Doubtless in thrifty growing trees many of the grubs are drowned out by the sap before they get fairly established in the trees.

A means of preventing the beetle from depositing the eggs would be to clear all rubbish away from the base of the trees in the spring, and in the early summer months, June or July, rub soft soap on the trunks and in the forks of the lower branches, or wrap building paper around the trunks, to remain there during the period for depositing the eggs. It is not known that they are subject to any parasites, and the only aid in the animal kingdom for destroying the larvæ is the

wood-peckers, and the only valuable one among them the Downy wood-pecker (*Picus Pubescens*), which is a winter resident here, and the most valuable bird we have for destroying all kinds of larvæ that work in our trees, and it should be protected and encouraged to frequent the orchard by placing bits of fat meat in the forks of a few of the trees in the coldest weather. I have not been troubled very much with this insect while my trees are cultivated and kept growing thrifty, but as soon as the trees become stunted by growing in grass, injury from sun-scald, or hard winters, or any other cause, they soon fall a prey to them. A single borer in a large tree would not do very much injury, while three or four would girdle and kill it, and a single one would destroy a tree an inch in diameter. There are some nurseries that are infested more or less, and those purchasing trees should make a careful examination of them at the time of planting. The damage done the first year is slight, but the work of the second year together with the shock of transplanting will result in certain death.

The following paper was read by Mr. Deacon:

ORCHARDING IN MINNESOTA.

By Edward Deacon, Rochester.

The attempt to write an essay covering the subject of "Orcharding" seems like the effort of Queen Dido to encompass a kingdom with a bullock's hide, and since I find the essay, as she did the hide, too small for the purpose, am not sure but I shall follow her famous example, and taking but small shreds of thought, tie them together and simply outline or encircle the subject, leaving vast fields unexplored that properly fall within my outline.

Aware of the many controverted points in "orcharding," I shall endeavor not to lay down fixed rules where none as yet exist, but to ground my suggestions on what I believe to be the experience of the majority, as observed during some months of travel in the tree business in different sections of Southern Minnesota.

VARIETIES.

First, as to varieties. Few men find it convenient to buy their trees at the nursery, and thus avail themselves of the nurseryman's advice; but this is not so material, provided cool judgment and common sense are exercised in the choice.

Many Minnesota planters have yet to learn that a Duchess grown at Davenport, Ia., or at Dayton, O., is not so hardy as a Duchess grown at home; that apricots are utterly worthless in this State, and mulberries but little better, and that but few varieties of apples are yet safe to plant extensively in Minnesota. But if the planter will avail himself of such information as may be gleaned from the horticultural reports and farm journals of his State he need not act altogether in the dark when selecting his trees, and need not be wholly at the mercy of the Southern tree agent when he displays his brilliant profusion of colored plates and his magnifying jars of Southern fruit.

As to the question which must go, seedlings or Russians, we should not be so partisan as to cast aside valued and tried varieties of either class. For Southeastern Minnesota nothing as yet excels the Duchess for summer, and what have we yet found for fall and early winter that is safer than the Wealthy? Among the winter varieties the McMahon White is giving great promise of value for general planting. Of the hybrids, the Whitney No. 20 is among the best and safest for fall use. To summarize: If our object is fruit growing, we must plant the old stand-bys and not make experimental stations of all our orchards.

TRANSPLANTING.

But I am dwelling too long on this one point. Having decided upon the varieties, when shall we buy? If possible, have the trees removed from the nursery in the fall. This plan is being adopted more and more widely every year, and for valid reasons. In digging the tree many roots are necessarily cut by the spade. Now if these roots are neatly pared with a sharp knife and the tree buried for the winter, these root ends will heal over during those long months of rest, and be ready for business as soon as transplanted in the spring much sooner than if dug in the spring when the sap is flowing and the buds are swelling. Again, should there be an uncommonly severe winter, the vitality of even our hardiest varieties will be taxed more or less if standing in the nursery; if now in the spring of the year you tear it from its mooring and transplant it, the tree has a double injury to overcome, and will most likely make but a sickly growth during the first summer, whereas the tree from the pit, with all the vitality it had when buried (some say even more), its roots nicely healed, goes to work at once for a good year's growth and is well prepared for the test of its first winter.

As to the best age for transplanting, a three or four year old tree is

to be preferred, as trees of that age, if properly dug and trimmed, have plenty of root for their support.

LOCATION.

A very important item in "orcharding" is the selection of a site. It is now pretty generally conceded that a northern or northeastern slope is to be chosen if possible. This avoids, in a measure the repeated freezing and thawing of early spring which has been so prominent a cause of mortality in most orchards. But if a southern slope must be taken these ill effects may be largely overcome by heavy mulching around the trees before the thawing begins in the spring. Again, choose the highest ground possible. All experience proves that the hills and not the valleys are the best places to raise apples in Minnesota, as the temperature falls much lower in the valleys than on the high grounds.

Concerning the proper soil for apple trees, we cannot yet speak with much assurance. In floriculture it is known, for instance, that the cactus loves the sand, the heliotrope flourishes in a moist black loam, but who has yet ascertained the exact proportions of black loam, of clay, and of sand, the precise amount of moisture and degree of fertility in the soil best suited to the wants of the Wealthy or any other variety? But the soil usually preferred by planters for an orchard of all varieties is, I believe, a rich loam with a liberal proportion of clay. If the soil is already rich it will do as it is for young trees, but if weak fertilizers should be used. If mainly sand a large hole should be dug and filled with soil of a suitable quality in which to plant the tree; this with proper fertilizing will overcome the lightness of the soil.

SETTING.

Before it freezes up in the fall it is well to dig the holes for the trees, as the effect upon the soil of the freezing and thawing and exposure to the air seems beneficial to the young trees. And in digging the holes the question of distance must of course be settled. Many, in planting orchards, stand the trees one rod apart each way, others two rods. But most varieties when given but one square rod of land will in old age overreach their allotted bounds, and interlace their branches with the neighboring trees, thus becoming much more subject to the infectious blight, and dwarfing all the fruit on the lower branches. It is better economy to strike a mien, some of the smaller varieties doing well at twenty feet apart, others needing twenty-four feet, but few, if any, needing as much as thirty-three feet.

As soon as the ground is in good condition in the spring, the trees should be taken from the pit as fast as they can be set in the orchard. With a pailful of water and a rake or hoe, make a puddle of very thick mud in the bottom of the hole in which you are to set the tree; settle the roots into this mud till every root is covered with it. This precaution avoids the danger of leaving open spaces among the roots and secures, in a measure, against the drouth. Over this mud put several inches of dry surface soil and press it down hard. This prevents the ground from cracking as it would if the water were poured upon the surface, and it acts as a mulch to retain the moisture below.

The depth to which a tree should be set must depend on the soil. If in a moist location, one or two inches deeper than it stood in the nursery is sufficient. If in a very dry place, it had better be down four or five inches deeper. The young tree should be leaned a little to the southwest when set for two reasons. First, in order that the trunk of the tree may be shaded by its own leaves and branches to guard against the "sun scald." Some planters take the precaution to drive down a sharpened board on the southwest side of the tree, as this is the direction of the hottest rays, and the practice is to be commended. Again, as our prevailing winds are from the southwest, if the tree is set vertically at first, it will in time, if exposed to the winds, be found leaning to the northeast. If the loss of root in digging has been considerable, the top should be cut back in proportion.

Now, before you call the tree fully set, attend to the mulching. Bring some old rotten hay, straw, chip-dirt or saw-dust, and bring it in liberal quantities. Do not put it against the tree, but leaving a few inches of bare ground around the tree, let the mulching extend back three or four feet in every direction, and make it thick enough to hold the moisture in the ground. A very good and lasting mulch is made of broken bricks or small stones. If the drouth should be long and extreme, it may be well, perhaps, every three or four weeks to put a few pails full of water on the mulching, but water with care, and remember that large numbers of trees are killed every year by over watering, and it has been found by observation to be often the case that the more wheat and corn a man loses by drouth the more trees he will kill with water, being very persistent in his overnursing, till the tree finally gives it up in despair, while his neighbor, who has had no time for such work, can show a vigorous orchard. Don't water too much.

When the trees are planted and mulched, don't sign their death warrant at once by turning in the hogs and calves, but put the ground

to better use, you may thus save yourself and neighbors the discouragement and disgust with "orcharding" that must necessarily follow from watching a nice young orchard grow sickly and die without understanding the cause. While the trees are small use the place as your garden; you can raise your potatoes, onions, and cabbages there with great benefit to young trees and thus suffer no loss of ground. Continue this practice till the trees are too large to allow the vegetables a healthy growth, when the trees themselves will pay for the ground they use—even then they should not become sod-bound, for if we expect the tree to draw several bushels of nice apples every year from the same soil, we should assist nature in the work by enriching that soil. I do not believe there is much danger of forcing too rank a growth upon a bearing tree.

WINDBREAKS.

We must not forget or neglect to shield our orchards from the blizzards and the cyclones by a good and sufficient windbreak. An evergreen windbreak should be secured if possible, on account of its superiority, in winter, over every other kind, and its beauty at all times of the year. And for this purpose we may well place the Norway Spruce at the head of the list, and the White Pine second, and several other varieties are to be preferred before deciduous trees. Where evergreens cannot be obtained the white willow should be used, as its hardiness, its rapid growth, its beauty and strength make it one of the most efficient of deciduous screens. It is a noticeable fact that most planters place the windbreak too near the orchard. It should stand back ten or fifteen rods, in order that the heavy snowdrifts lodged by the windbreak may lie outside of the orchard. This windbreak should stand upon three sides at least, north, west and south. The east is not so material.

How to bury a tree for the winter; how to properly prune; how to keep the bark healthy; how to guard against borers, caterpillars, and other insects; against rabbits and mice. The entire topics of plum and cherry culture are divisions of the subject of "orcharding," upon which I have not touched, but I fear I have already written at too great a length.

One more thought. What means the cry, "We can't raise apples in Minnesota?" Does it mean that all those that utter it have given the matter earnest, thorough and intelligent trial, and speak from experience? I cannot believe it. For, by some travel and inquiry, I have found that most of the trees planted come from southern nurse-

ries directly or indirectly, or else have been killed by the planter's own negligence or his not knowing how to properly handle them. Until, instead of trying to improve his methods, he becomes disgusted with the business and joins the popular cry. It was the cry in Michigan, Wisconsin and in Iowa. But the successful effort of persistent men are silencing the cry there, as they will do ere long in Minnesota.

NOTES ON ONION CULTURE.

By Wayland Stedman, Rochester.

An Irish woman once told me that "it was very poor onion seed I was selling her; I had sold her an ounce of seed, last spring, and never an onion was larger than the smallest egg; and it was the best cultivation she gave them; for she plowed the ground a foot deep and made it as loose and fine as a pile of ashes and raked the seed in with a garden rake, and kept the soil pulverized all summer with a hoe."

Now every onion grower knows that her method of culture would have given a fine crop of potatoes, but was a ruinous one for onions. I have found that many farmers think they cannot raise onions; as I have often asked them to buy a few ounces of seed and sell us onions in the fall, and in many cases the answer was: "O, onions won't grow with me; I tried to raise them some years ago and made a failure of it, and now buy what few we want."

Of course, onions are not so accommodating as wheat and oats. They are like some men, they must have their own way; but, unlike many men, they are not ungrateful, for give them the soil and culture that they require and they will return the kindness by yielding eleven hundred bushels per acre. Every family ought to consume a great many onions, for of all cultivated garden vegetables they are the most nutritious and contain more medicinal properties.

SOIL.

Onions must have a well drained soil. If the soil is heavy and allows water to stand on its surface, the onion roots will all be very close to the top of the ground, and will not penetrate into the soil and collect sufficient plant food to make a good crop. Black soil, with a sandy subsoil, is good. A slough, underdrained, is a number one place for onions.

Experience has taught me the necessity of thorough drainage, and

I will not soon forget it, for some years ago I lost the entire crop by sowing the seed on a rich, black mucky soil. I expected a great crop and kept the ground clean, but I found that after every rain the onions did not grow at all for two or three weeks, and the result was that in September the tops were fresh and green and as far from being matured as they should have been in July. The next year I cross-plowed and made ditches lengthwise and crosswise, and the crop was good, some onions being as large as saucers.

Onions were first grown in Egypt on the fertile banks of the Nile, which were yearly enriched by the overflow of that river. And for that reason good crops of onions cannot be grown on virgin soil without some kind of manure, although I have heard that good crops have been raised on new breaking, the seed being sowed broadcast and dragged in. But that was done a great ways off, and I never saw the man who did it. If done at all, it must have been in a soil on which large quantities of brush and trees had been burned, leaving the ashes on the ground. Ashes containing potash are one of the best onion fertilizers.

MANURE.

Onions need, for a heavy crop, more nitrogen and potash than is to be found in new ground, hence the ground should be manured every year. Animal manure contains both nitrogen and potash. Unless the manure is old the onions are liable to be soft and have large necks and do not keep well. Horse manure is better than cow manure. Greener manure can be used if spread early in the fall and plowed under. If the manure is very fine it will go further if spread after plowing and dragged in.

Long Island onion growers buy horse manure direct from the street car stables of New York city and put one hundred cart loads on an acre. Sometimes they pay as high as sixty-five cents per load. The manure is not mostly straw, like our manure out West, but contains very little litter.

A German farmer not far from Rochester always raises good onions with no other manure than ashes. He throws all of the ashes, the year through, as fast as made, upon the onion bed, scattering them during the growing season upon the rows. Ashes not only furnish plant food but also help to keep the ground moist, which is very important for onions. Thirty or forty loads of well rotted and moist stable manure, spread in the fall and plowed in the spring and dragged in, will give a very large crop of sound and well keeping onions.

PREPARATION OF SOIL.

A suitable onion soil should be selected. Manure heavily during winter or spring with any kind of manure and plow very early and deeply eight or ten inches at least. About the first of June plow again the other way and set out late cabbages. The ground is plowed twice to mix the manure with the soil and to help drain the soil, and it is plowed deeply so that some of the manure at least will be well under the ground where it will collect moisture, and store it up for the use of the onions in the following year. Also, the presence of manure at the depth of six or eight inches will prevent the soil from becoming very hard at that depth. This is important, for the next year the ground is plowed quite shallow.

The ground is set with cabbages because cabbages are easily kept clean, most of the work being done with a cultivator. Not a weed should be allowed to grow to seed. The cabbages should be all pulled up by the roots. In the fall as soon as the cabbages can be taken from the ground, spread on the well rotted manure. This manure, being hauled during the winter or spring before, and put in a pile about six feet high with a flat top, under a roof if possible, has fermented and most of the weed seeds are killed. The ground is then to be plowed about four inches deep and left without being dragged during the winter.

In the spring, as soon as dry enough, the ashes are spread, if at hand, or fine muck or peat marl or land plaster is sometimes used. Then the ground should be dragged until very smooth and quite firm. It is important to have the ground firm, but of course not hard. If there are sticks, stones, roots, etc., on the ground they should be raked off with a steel rake. Then the seed can be sown, and this can be done better and quicker with a seed drill. I use the Planet, Jr. The rows should be twelve or fifteen inches apart. On soil not very rich three pounds of seed are enough for an acre, but on ground prepared as above directed six should be sown. Four or six pounds are usually sown upon an acre.

Onions will sprout in as low a temperature as wheat, while weeds will not. Therefore the importance of preparing the ground in the fall. Any weather that will not injure wheat will not injure onion seed. But new American grown seed I am speaking of, and they will stand more unfavorable weather than imported seed or old seed. In fact most imported seed is not hard and should be sown later. Imported seed produces larger onions, but they are milder, softer, and do

not keep as well as those raised from American seed and are never sown extensively. The bulb of the onion should be on the top of the ground because it does not in anyway feed the plant. That is done by the long white roots which often are from six to eight inches in length. It is also a fact that onions will not bottom unless the soil is firm. If the soil is mellow and loose when the seed is sown, the onions will not form bulbs until the rains have packed the ground. Fall plowing becomes firm sooner than spring plowing, and for this reason we get earlier onions from land fall plowed.

CULTIVATION.

It is almost needless to say that the onion patch should be kept clean. Cultivation should commence as soon as the rows can be seen, even if there are no weeds. It seems impossible to raise onions without hand weeding, as very rich ground will produce a great many weeds. Hand weeding is the great drawback to onion culture, for without it onions could be raised cheaper than potatoes. And the onion grower who keeps his ground clean with the least hand weeding makes the most money. Hence the importance of allowing no weeds to seed the year previous on ground sown to onions and of making the manure heat to kill the seeds it contains. But in spite of all that can be done some weeds will come up. If the rows are very straight a wheel hoe or shovel hoe can be run within a quarter of an inch of the onions when they are small, thus considerably lessening the work of the hand weeder. In dry weather perisperm grows in great quantities and is looked upon as a great enemy, but I sometimes think it is a friend; for if it is kept hoed up, the surface of the ground will be loose. If the surface of the ground is kept loose to the depth of an inch the soil next under will not dry out as much as if the surface is baked hard. The loose soil on top acts as a mulch.

As soon as the onions are ripe they should be pulled at once, for the fall rains will make them grow again. And if they commence to grow after they are ripe they are nearly worthless. They must be used at once for they will not keep. They will sprout and grow, no matter how dry they are kept.

The best way to pull onions is to use a potato hook or a dull pointed iron rake; raking out one row at a time and raking two rows together. If the onions are sown early they will mature early, and if allowed to lay on the top of the ground for a few days during a dry time, the tops will dry up to almost nothing and can be very rapidly broken off with the fingers when picked up. Cutting off the tops is slow and

expensive, and onions do not keep as well as when the tops are pulled off. After the onions have remained in rows for four or five days and are dry, they should be stored under cover until freezing weather begins, and then put in the cellar, and they will keep perfectly sound until the next June, if they have been perfectly cared for. I have kept white onions without a sprout until spring.

Mr Lory, of Isanti county, by request furnishes a paper on the cranberry.

CRANBERRY CULTURE.

By H. A. Lory, Maple Ridge.

What little information I have gained on the cultivation of cranberries has cost me rather dearly, but is gathered from an experience extending over a number of years. It may not be amiss to mention some of these incidents of this experience, in this branch of fruit raising.

I was brought up in Schohaire county, New York; resided in Wisconsin eleven years, and since November, 1875, in Minnesota. I owned five different marshes in Wisconsin, but none of them proving satisfactory, I spent more or less time during a period of three years in securing a better location for conducting the cranberry business; have traveled thousands of miles, crossing the country by the use of maps and charts, and a surveyor's compass.

In Wisconsin I met an old Indian chief possessed with more than usual intelligence, who in answer to my inquiry, said I should not be discouraged in looking for a desirable marsh, as it would be found by diligent search. It should be stated that while there are good marshes, there are many contingencies that enter into the question of success or failure, such as the character of the soil, climate, stage of development of the marsh, its capacity for the growth and perfection of berries, etc. A marsh may be entirely unsuitable for cultivation, or it may have been well suited for development for thousands of years.

A marsh may have the required elements to mature sound, healthy vines and fruit. But a good marsh may change suddenly altogether, the soil becoming fermented, sour and poisoned from a change of temperature, from dams, ditches, etc., and thus the best stage may have passed by never to return. On the other hand, its best condition

may not have been reached; as to this fact, however, time and experience alone will determine. A period of ten years is none too great, in my opinion, to ascertain fully in regard to this matter.

Some marshes prove to be superior to others and produce fruit almost spontaneously among the mossy roots, rubbish, etc., but when the conditions change and the underlying substratum fails to provide the required nutriment it may result in a necessary abandonment of the marsh.

Many seem to entertain the idea that it is all clear gain in cranberry culture, and there are enormous profits to be realized within a period of three or four years at most. If, however, they engage in the occupation and no results are realized, they become discouraged, without taking into consideration the conditions and methods of success. It should be borne in mind that where one succeeds there are perhaps fifty who make a failure. I do not advise anyone to engage in this business unless he is able to experiment in a thorough and systematic manner, whether successful or not.

I have been told that I was very foolish to stick to this "old cranberry swamp," and to work and expend all the money I could get when I never could make it amount to anything. These theories have not, however, discouraged me from continuing my efforts. I feel confident I have passed the most difficult point, and am more and more encouraged each season.

My marsh is now well subdued, is in good form, occupying about one hundred acres. Have about three inches fall, affording ample means to dispose of surplus water, and, by the use of an upper gate, an ample supply of water when needed.

A marsh may possess nine points of excellence, and one undesirable feature may overbalance them all. Some peat is too soft, some too hard, some too wet, some too dry; again the water may injure the vines. Where a marsh has had only rain water upon it, and it is replaced with mineral water, it may prove disastrous, or the reverse. Much damage may be done by a novice using too much or too little water, as it must be used at proper times and in sufficient quantities for the purposes required. I find the injury when it occurs, increases usually in a ten-fold ratio.

I met a man below St. Francis some years since, who said he drew the water from his vines about June 15th, but could give no reason whatever, as to warmth, drouth, or fertilization.

The season here being of short duration between killing frosts, it requires finer manipulation than where seasons are longer. I have ex-

perienced injury from frost as late as June 20th, and as early as August 13th, and much care is necessary in the management of the marsh, to secure desired results. One must understand the whole situation. The water in the spring must be retained long enough, but not to prevent growth of vines and maturing of crop, at the close of the season. Depth of water is another item, its use depending upon the objects to be secured. In my experience it is not proper to give the bed water before October 15th, and not according to nature. Last season I let on the water November 1st, and drew it off May 1st. My berries matured thirty days earlier than ever before known, and I commenced picking August 15th, and finished on the 24th. The next morning, the 25th, there was a heavy frost. A neighbor who had a few berries, picked but few of them, as they were too green.

I have spent some fifteen years experimenting. When I began I supposed I was a master of the business, and that all there was to do was to gather the fruit. I have found this to be a serious error, and feel that I know very little about it as yet.

My entire crop was estimated at 3,000 bushels, but on account of fire July 2d to 7th and cut worms I only harvested 250 bushels. Was awarded first premium at the State fair last fall and also at the winter meeting of your Society. I would like to see more samples of fruit exhibited at our fairs.

THE PEERLESS APPLE.

By O. F. Brand, Faribault.

At the request of the President of our State Horticultural Society, made at our State Fair in 1886, for the history of this celebrated apple, I will now give it.

In 1857 or 8 Geo. Dorrance, now deceased, of Walcott, Rice county, planted an orchard of several hundred apple trees. It was on the extreme eastern edge of the Big Woods, facing and open to the prairie on the north and northeast. The varieties were Wine Sap, Fall Orange, Fameuse, Red and Green Sweeting, Golden Russet, Talman Sweet, and other popular Eastern varieties, together with six trees of the Duchess. The latter were among the first to bear, and those six trees became celebrated in this part of the State nearly a quarter of a century ago. I first saw the orchard in 1864, and frequently in 1866. In 1867 the orchard bore a large crop, Duchess being heavily loaded. Talman Sweet and Golden Russet stood not far from Duchess, blossomed and bore a little fruit that year. I think it was from the crop of 1867 that G. J. Miller, who then and still resides two and one-half

miles from this orchard, saved a quantity of seeds from Duchess apples from Mr. Dorrance's trees. He planted the seeds on his farm on the prairie and from them raised more than 200 trees. He says he planted seed from no other variety but Duchess. He cultivated these trees up to 1872. That winter, 1872-3, killed the most of them. The best of those that lived he transplanted to his orchard in the spring of 1873, there being about a dozen of them.

I saw these seedlings for the first time in the fall of 1875. Several of them were then bearing, and some of them well loaded with fruit. I did not see the fruit of Peerless at that time, as it bore but three apples that year and someone had stolen them. I was so impressed with the appearance of the tree that I then and there wanted to buy the right to control it for one year, and offered Mr. Miller such a large price that he became alarmed as to its probable value, and as a result I did not get the scions and the tree was not propagated from till the spring of 1887. This explains to the public why there are no trees of it for sale.

The fruit of Peerless and several of the other seedlings was shown at the State Fair in 1878, and also at the winter meeting of this Society in 1883. A half bushel of Peerless apples was sent to New Orleans in 1884. It took the First Premium at our State Fair in 1886 and was there awarded \$5 as the "Best apple for all purposes of Northwestern origin." Being on exhibition at our winter meeting in January, 1887, it was pronounced by vote of this Society "The best seedling apple known."

Of the productiveness of the Peerless I will say, it bore one bushel in 1876, kept increasing in its yield till it bore seven bushels in 1882, nine bushels in 1884, about one bushel in 1885 of extra large fine apples, and more than ten bushels in 1886. Mr. Miller says of the fruit that it averages as large as Wealthy, if not larger; ripens from ten to twenty days later; hangs on the tree in a high wind perfectly; keeps better than Wealthy and is fully its equal in flavor and quality.

Mr. Miller's orchard is on a black loam, prairie soil with clay sub-soil, and is on the prairie about two miles from the edge of the Big Woods, and more than ten miles from any lake. The location is a bad one, as is proved by the fact that five-sixths of Duchess and all of Wealthy in the same orchard were killed in 1884. In 1885 the orchard seemed to be the hot-bed of blight, yet Peerless escaped uninjured.

There is not another tree in the known world that has stood or can stand what Peerless has stood for twenty years, and produce the large crops of fine winter apples it has produced. It is rightly named. It has no peer or equal in this dry, cold, windy climate.

NORWAY SPRUCE FOR SHELTER BELTS.

E. H. Ricker, in a recent issue of *The Farmer*, of St. Paul, says:

"Nearly all the thrifty growing evergreens are valuable as a shelter belt where they are hardy, but the tree that has stood the test, and has proved the most valuable as a tree for shelter is the Norway Spruce. It is hardy, is adapted to prairie soil, and where it has been properly handled and well cultivated, has given perfect satisfaction. It is a tree that commends itself, and all that is necessary is for the people to become acquainted with it. As we have had an opportunity to know this tree and see it grow for many years, we feel fully capable of telling your readers its value as a protection. We give a short history of the Norway Spruce in this vicinity:

"Two or three years ago a row of Norway Spruce was planted along a roadway in the Elgin nurseries, by D. C. Scofield, a resident of that city. The farm selected by Mr. Scofield was about one and a half miles west of the city, on the open prairie. Not a sod had ever been turned—it was the virgin prairie. He started the plow, and got a piece of ground in as good condition as possible, in the tough prairie soil. The next year he sent his order to a large nursery firm in Scotland for a quantity of small Norway Spruce seedlings, there not being any nurseries in this country at that time where the Norway Spruce was grown in large quantities. They arrived, after being many weeks on the ocean, and thence by rail from New York to Elgin. Not a tree failed. The plants were two years old at the time of planting. At the expiration of ten years, accurate measurements, made by the Horticultural Society of Illinois, as recorded in their report, showed that many of them were over two feet in circumference, and over twenty feet high. Measurements recently made show many of them to be six feet ten inches in circumference, and seventy-three feet high; and for twenty-two years they have been a protection against the fierce storms of this climate. Although Mr. Scofield was upwards of fifty years of age at the time of planting, he still enjoys the benefits of this magnificent shelter belt. His experience proves that a man past middle age may enjoy many years of pleasure and profit, as a result of his foresight in planting evergreens for protection.

"We recommend Norway Spruce as the best for shelter belts; the next in order are American arbor vitæ, red cedar, and American white spruce. White, Scotch, and Austrian pines are reliable evergreens, but we do not recommend them for shelter belts."

We give a very good representation of the Norway Spruce, as shown in *The Farmer*:



NORWAY SPRUCE.

Mr. Sias, of Rochester, recommends evergreens highly for shelter belts. He gives the following list:

1st, Norway Spruce (*Abies Excelsa*); 2d, White Pine (*Pinus Strobus*); 3d, Red Pine (*Pinus Resinosa*); 4th, Hemlock Spruce (*Tsuga Canadensis*); 5th, White Spruce (*Abies Alba*); 6th, Scotch Pine (*Pinus Sylvestris*).

He says: "We head the list with the Norway Spruce, first, because it is capable of resisting a stronger wind than any of the others, unless it is the white spruce; second, it has more fibrous roots, hence less loss in planting; third, it is a fine looking tree. Josiah Hooper says: 'Of all the hardy evergreens this appears to be the most suitable for shelter, dense and compact in its growth, hardy to the utmost degree, and vigorous in almost every soil; it is certainly the perfection of plants for a screen. We must confess to having nothing that will compare with this invaluable tree for all purposes.'"

YELLOW TRANSPARENT APPLE.

Syn.—Yellow Transparent, White Transparent, Red Duck, Charlottenthaler, Grand Sultan, Russian Transparent.

Mr. Gibb, of Abbotsford, thus describes this variety: "No. 334, Yellow Transparent (*Skvosnoi joltni*). This is now widely known. It is earlier than Early Harvest, and much like it in appearance and quality."

Yellow Transparent is one of the seven leading varieties of apples recommended for planting in Wisconsin, by the Horticultural Society of that state.

Mr. Wm. Toole speaks of this variety as observed in the orchard of A. G. Tuttle, of Baraboo, in the following glowing terms: "A clear, waxy, white-skinned apple, of good quality, juicy and very early. It is hardy, a constant and enormous bearer." (See vol. xv, p. 455.)

Geo. P. Pfeffer, of Pewaukee, at the late annual meeting of the Wisconsin Horticultural Society, reports that "in his search in different orchards in Wisconsin he finds Duchess and Tetofsky the best preserved varieties, although Alexander and Transparent are found to be all right." Of a dozen or more Russian varieties set in his own orchard he says: "Those that are satisfactory are Yellow Transparent, Long Arcade, Hibernial and Longfield."

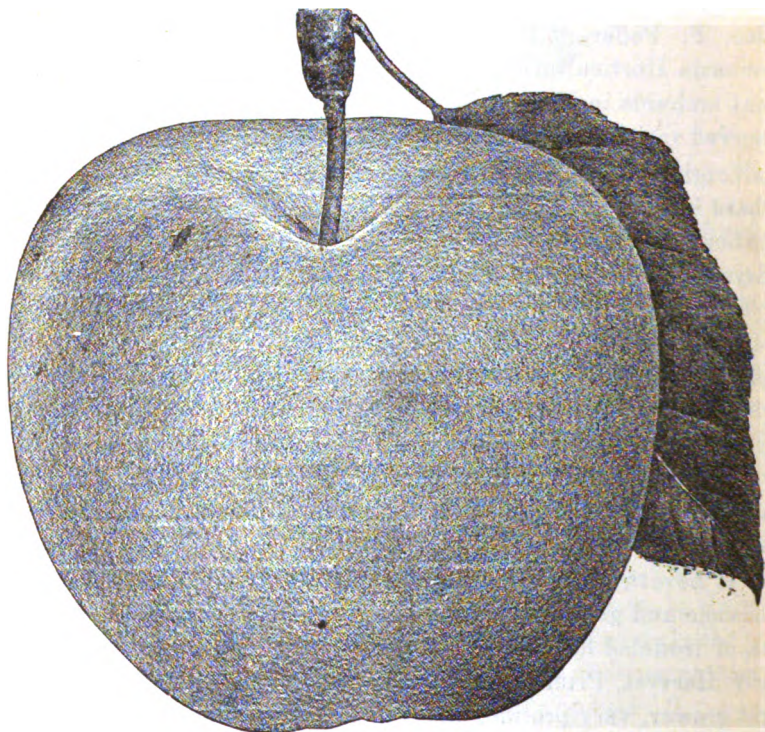
Says *Farm, Stock and Home*: "If the efforts to introduce Russian apples into the Northwest had resulted in but this one acquisition, it would amply repay all trouble and expense. It is the best *very* early apple, pleasanter than the Early Harvest in flavor, ten days at least earlier, better and younger bearer, and much superior, as a keeper, to any early apple. It has that mellow, luscious appearance of the Sweet June, with its minute specks. Undoubtedly it would pay to plant it quite extensively near Minneapolis and St. Paul for the city markets."

J. T. Lovett, of New Jersey, says of it: "The earliest of all apples; handsome and good. Of Russian origin, and like all the Russian apples, of ironclad hardness. It ripens fully ten days in advance of Early Harvest, Primate and other early varieties. Tree a free, upright grower, very prolific, and a remarkably young bearer, frequently producing in the nursery rows the second year from the bud. Fruit growers in New Jersey who have this apple in bearing are realizing immense profits from it."

Dr. Hoskins, of Vermont, says: "The tree is a free and symmetrical grower, upright when young, but spreading as it becomes older

under the loads of fruit. It is a healthy tree, and like most of the Russians, ironclad against cold, enduring forty degrees below zero without injury. It is a heavy bearer annually in rich gardens, but biennially in poorer soils or in sod. The fruit fairly grown, is medium in size, though specimens that would rank as large may often be found on young trees in good soil. In delicate, waxen beauty, the Transparent, when allowed to mature upon the tree, is unequaled among American apples. The fruit is always fair, and its attractive appearance, joined with its very good quality, makes it extremely salable. As an early market apple it has great merits. If gathered just as the seeds begin to color, it bears transportation well, and will keep two weeks or more before showing any signs of deterioration."

We are under obligations to *Farm, Stock and Home* for use of cut of this New Russian apple.



YELLOW TRANSPARENT APPLE.

GENERAL INDEX.

A

	Page.
Action on president's address	74
Address of welcome, Hon. I. Atwater.....	24
<i>Agricultural Society—</i>	
Financial exhibit.....	222
Officers of.....	4
Allyn, J., early beets and tomatoes	234
<i>Amber Cane Association—</i>	
Officers of.....	138
Proceedings at annual meeting.....	129
Amber cane industry, S. H. Kenney.....	134
American Forestry Congress.....	221
American Horticultural Society, delegates to	410
American Pomological Society.....	70, 190
Annual address, A. W. Sias	429
Annual address of president	61
An amateur's flower garden, F. H. Carleton.....	274
<i>Annual Reports—</i>	
Entomologist	280
Librarian	226
Secretary	205
Treasurer.....	235
<i>Apples—</i>	
At the fairs....	208
Discussions on	106, 254
Minnesota seedlings.....	96, 355
Russian varieties	116
Scab on.....	57
Varieties recommended.....	253, 303
Appointment of committees.....	23, 127
Asire, Prof. L., report local societies.....	87
Atwater, Hon. Isaac, address of welcome.....	24
Arctic flowers, Mrs. C. O. Van Cleve.....	265
Award of premiums.....	238

B

Barrett, J. O., benefit of forests.....	389
Birds, English sparrow, etc.....	49, 71, 289

Blackberries—

Essay on, B. T. Wilcox.....	317
Essay on, Miss Edith A. Kellogg.....	322
Varieties recommended.....	321
Blight.....	406

Brand, O. F.—

The apple—what may we expect from it in Minnesota?.....	324
Evergreens for windbreaks.....	151
Experiment station report.....	347
Peerless Apple.....	447
Report on pine lands.....	260
Brand, Norton F., orcharding in Minnesota.....	299
Brimhall, W. H., treasurer pro tem.....	24
Brown, C. F., report on fruit.....	360
Brown, J. H., letter from.....	154
Budd, Prof. J. L., on forestry.....	291
Buffalo berry.....	406
Bunnell, M. C., report on fruit.....	356

C

Call for meetings.....	17
Carleton, F. H., amateur's flower garden.....	274

Cleveland, H. W. S.—

Paper on street and lawn planting.....	164
Reminiscence by.....	190
Climate of Minnesota.....	353
Commercial horticulture.....	206

Committee—

Award of premiums.....	23
Finance.....	226
Fruit, flowers and vegetables.....	23
Legislation.....	409
Native fruits.....	111
Obituary.....	23, 413
President's annual address.....	74
Prize essays.....	127, 299, 310, 316
Standing.....	6
Resolutions.....	23, 409
Revision fruit list.....	23, 253

INDEX.

Constitution and by-laws.....
Cook, Dewain, dewberries, etc.....

Correspondence—

S. B. Barnard
J. H. Brown
Hon. N. J. Colman.....
R. L. Cotterell
E. DeBell.....
H. S. Devol
G. Doppelmair.....
C. W. Garfield.....
Charles Gibb.....
Oliver Gibbs, Jr.....
J. S. Harris
Mrs. J. R. Johnson.....
Chas. A. Keffer
Geo. J. Kellogg
D. F. Kelley
John Little.....
T. T. Lyon.....
Hon. A. R. McGill
Prof. O. W. Oestlund.....
C. H. Pond
C. W. Sellye.....
Wm. Somerville.....
H. C. Van Deman
C. H. Warren.....
C. M. Weed.
Cranberry Culture, H. A. Lory
Currants.....

Cutler, Milon—

Address as president of local society.....
Report as vice president.....
Resolution on postage.....
Cuzner, E. A., report as librarian.....

D

Dakota Horticultural Society
Danforth, Wm., small fruits.....

Dartt, E. H. S.—

Experiment stations
Report as Vice President.....
Response to address of welcome.....
Superintendent of experiment station
Day, D., elected treasurer.....

Deacon, E.—

Orcharding in Minnesota	436
Report as secretary local society	29
Delegate to Dakota, A. W. Sias	123
Delegate to Wisconsin, J. S. Harris	121
Demand and supply	65
Densmore, B., improvements in machinery, etc.....	123
Dewberries.....	104, 317, 323

Discussion —

Apiculture	138
On apples	349, 337
Birds	289
Black walnut	251
Experiment stations.....	54, 374
Forestry.....	155, 203
Insects	287
Jessie strawberry.....	37
Pine land.....	263
Russian fruits	254
Seedling fruits.....	106
Sewerage, etc	185
Small fruits.....	37, 230
Tree peddlers	53
Vegetables.....	237
Doppelmaier, letters from	399
Drainage of cities, etc., Prof. W. W. Folwell....	173

E

Editorial notices.....	213
Election of officers	138, 253

Elliot, Wyman—

Annual address as president.....	61
Delegate American Horticultural Society	410
Letter from.....	425
Entomologist's report, Prof. O. W. Oestlund	280
Entomology	280, 285, 432
Essays.....	18, 127, 237, 293

Evergreens—

Discussion on	155
Reports on.....	151, 345 352, 449
Experimentation	223, 343

Experiment Stations—

At Owatonna.....	68
At Excelsior.....	69
Co-operative.....	374
Reports from.....	349, 364
Scope and usefulness.....	59
University farm.....	364

F

Failures.....	64, 357
Farmers' Institutes.....	67
Farm, Stock and Home.....	207
Finance committee, report of.....	236
Financial condition of Society.....	224, 226
Fitch, John, report on fruit.....	362
Floriculture, papers read.....	265, 271, 274, 398
Flowers and roses, Mrs. M. S. Gould.....	50, 271
Folwell, Prof. W. W., disposal of city cleanings.....	173

Forestry—

Benefits of.....	389
Discussion on.....	155, 203
In Europe.....	219
In Minnesota.....	218
Papers on.....	66, 146, 196, 217, 389, 397
Forests and mines, S. M. Owen.....	186
Forcing Houses, J. S. Gray.....	118

Fruit District Reports--

A. W. Blas, Rochester.....	240
E. H. S. Dartt, Owatonna.....	243
Milon Cutler, Sumter.....	245
N. J. Stubbs, Long Lake.....	247
G. W. Fuller, Litchfield.....	249
Fruit blossoms, report on.....	114
Fruit list, revision of.....	253

Fuller, G. W.—

Committee on president's address.....	74, 408
Reports on fruit.....	349
Report from fifth district.....	249
Report on seedlings.....	106

G

Gardening and flowers, Robert Hale.....	398
Garfield, C. W., letters from.....	40, 380
General fruit committee reports.....	354

Gibbs, Jr., Oliver—

Dakota Horticultural Society	126
Letters from.....	44
New Orleans Exposition	264
Remarks of.....	158, 264, 287
Gooseberries.....	323
Gordon, Jr., G. Y., report on local society	36
Gould, F. G., value of timber.....	156
Gould, M. S., flowers and roses.....	271
Grape growing.....	75

Grapes—

Culture of	75
Papers on.....	75, 293, 419
Varieties recommended	360
Gray, J. S., forcing houses.....	118

Grimes, J. T.—

Delegate to California.....	410
Report as treasurer.....	226

H

Hale, Robert, gardening and flowers.....	398
--	-----

Harris, J. S.—

Committees.....	23, 127, 238, 316, 410
Delegate to Wisconsin	121
Experiment station report.....	346
Fruit blossoms.....	114
Grape growing for farmers.....	419
Insects injurious to horticulture	432
Letter from.....	427
Report on entomology.....	285
Seedling commission report.....	96
Hennepin county horticultural society	37

Hillman, S. D.—

Introductory note to portfolio	411
Report as secretary.....	205
Honey industry, discussion on.....	138
Honorary life members	11
Honorary members, five years	10
Hoag, Charles, memorial.....	413

Hoskins, Dr. T. H.—

Editorial notice.....	213
Opinion of Wealthy.....	339
Yellow Transparent.....	451

I

Improvements in machinery and processes of manufacture, B. Densmore. . .	139
Index	453
In memoriam	412
Insects	280, 285
Iowa Horticultural Society.....	417

J

Jessie strawberries.....	29
Joint sessions.....	17, 145

K

Keffer, Chas. A., letter from	379
Kellogg, G. J., letter from.....	41
Kellogg, Miss Edith A., essay on blackberries and dewberries	322
Kenney, Seth H., amber cane industry.....	134

L

Latham, A. W., committee on prize essays.....	127, 310
Latham, R. A., essay on grape growing....	293
Letter to Gov. McGill	2
Librarian's report.....	226
List of fruits.....	253

Local Societies—

German Horticultural Society, Ramsey county.....	418
Hennepin County Horticultural Society.....	37
Lakeside Horticultural Society.....	36
McLeod County Horticultural Society.....	81, 419
Olmsted County Horticultural Society.....	29, 425
Southern Minnesota Horticultural Society.....	29, 425
Southwestern Minnesota Horticultural Society.....	418

Lord, O. M.—

Experiment station report.....	342
Fruit report.....	354
Report on native fruits.....	111
Lory, H. A., cranberry culture.....	445

Luedloff, Chas.—

Climate of Minnesota	353
Experiment station report.....	350
Report on fruit.....	350

Lyon, T. T.—

Letter from	40
Visit from	216
Lyons, Wm., report on vegetables and fruit	236

M*McHenry, S. A.—*

Essay on currants and gooseberries	323
Report on fruit	355
McGill, Gov. A. R., telegram and letter from	129
Machinery, improvements in, B. Densmore	163
Meetings	23, 129
Membership	8

N

Necrology	413
New Orleans Exposition	227, 264
New Russians	332, 335, 367, 451
Norway spruce	449
Norwood, O. F., report on fruit	361
Notes on onion culture, W. Stedman	445
Nursery frauds	69, 77, 215, 249

O

Oestlund, Prof. O. W., report as entomologist	280
---	-----

Officers—

Amber Cane Association	138
For current year, 1888	252
Iowa Society	417
Local societies	29, 418
Wisconsin Society	417
Ornamental and forest trees	351
Orcharding in Minnesota, N. F. Brand	299
Orcharding in Minnesota, E. Deacon	436
Ornithology	70
Olmsted County Horticultural Society	29, 425
Owen, S. M., forests and mines	196

P*Papers —*

Amber cane industry, S. H. Kenney	134
An amateur's flower garden, F. H. Carleton	274
Arctic flowers, Mrs. C. O. Van Cleve	265

Papers—Continued.

Benefits of forests, J. O. Barrett	389
Blackberries and dewberries, B. F. Wilcox.....	317
Blackberries and dewberries, Miss Edith A. Kellogg	322
Claims of entomology, Prof. O. W. Oestland.....	280
Climate of Minnesota, Chas. Luedloff	353
Cranberry culture, H. A. Lory.....	445
Currants and gooseberries, S. A. McHenry	323
Disposal of city cleanings, Prof. W. W. Folwell	173
Early beets and tomatoes, Joshua Allyn.....	334
Evergreens for windbreaks, O. F. Brand.....	151
Experience in orcharding in Minnesota, Prof. W. W. Pendergast.....	291
Experiment stations, scope and usefulness, E. H. S. Dartt	52
Flowers and roses, Mrs. M. S. Gould.....	271
Forestry protection, Clarence Wedge.....	397
Forests and mines, S. M. Owen.....	196
Forcing houses, J. S. Gray	118
Fruit growing among Mennonites, D. Cook.....	231
Grape growing, N. J. Stubbs.....	75
Grape growing for farmers, J. S. Harris.....	419
Grape growing in Minnesota, R. A. Latham.....	293
Improvements in machinery and processes, B. Densmore.....	129
Insects injurious to horticulture.....	432
Native plums, D. B. Wier.....	381
Notes on onion culture, W. Stedman.....	445
Orcharding in Minnesota, N. F. Brand.....	299
Orcharding in Minnesota, E. Deacon.....	436
Pine lands in Minnesota, O. F. Brand.....	299
Skillful gardening, M. T. Ridout.....	423
Small fruits, Wm. Danforth.....	228
State forestry association, C. L. Smith.....	146
Strawberry and raspberry growing in Minnesota, A. N. Wilcox.....	310
Street and lawn planting, H. W. S. Cleveland.....	164
The apple, O. F. Brand.....	324
Tree peddlers, A. W. Sias	77
Wild food, Col. J. H. Stevens.....	193

Pearce, M.—

Committee on prize essays.....	127, 293, 299
Report on fruit	355
Peerless apple.....	100, 105, 331, 337, 447
Pendergast, Prof. W. W., experience in orcharding.....	291
Peterson, Andrew, report on fruit.....	117
Pine lands in Minnesota, O. F. Brand	260
Plums	48, 114, 381, 342

Porter, Prof. Edward D.—

Report from experiment station.....	364
Remarks by.....	227, 373
Portfolio of secretary	411
Premiums awarded	238
Premium list	21
Prize essays	18, 127, 237, 293, 409
President's annual address	61

Proceedings—

Amber Cane Association	123
Of the Society	29
Program of meetings	19

Q

Quality of Russian fruits	336, 451
Question box	19, 406

R

Rabbits.....	308
Ramsey County Horticultural Society.....	418

Raspberries—

Essay on, A. N. Wilcox.....	310
Varieties recommended	254, 315
Refrigeration.....	70
Response to address of welcome, E. H. S. Dartt.....	27
Retrospective.....	63
Revision of fruit lists	253

Report—

Amber cane	134
Entomology.....	280, 285
On fruit	354, 362
Librarian.....	226
Local societies	29, 418
Native fruits.....	111
President's address.....	408
Russian apples	116, 117, 367
Seedling commission.....	96
Secretary	205, 324
Treasurer	225
Vegetables and small fruit.....	236
Resolutions.....	409
Robertson, Col. D. A., remarks by	107, 203

INDEX.

Russian Apples—

Discussion on	
Reports on.....	
University farm.....	
Varieties recommended.....	
Russian Mennonites.....	

S

Saunders, O. E., report on fruit.....	
Sand cherries.....	
Seedling fruits.....	
Seedling commission report.....	
Secretary's portfolio.....	

Sias, A. W.—

Annual address.....	
Committee on revision fruit list.....	
Delegate to Dakota	
Experiment station report	
Report on fruit list.....	
Report on Russian apples	
Report as Vice President	
Seedling commission report.....	
The tree peddler.....	

Secretary —

Introductory note to portfolio.....	
Report of.....	
Skillful gardening, M. T. Ridout.....	

Small Fruits —

Discussion on.....	
Reports on.....	
Smith, C. L., paper on forestry.....	
Standing committees.....	
State forestry association	
Statistics.....	
State Fair.....	
State fruit farm, at Excelsior.....	
Stedman W., notes on onion culture.....	

Stevens, Col. J. H.—

Committee on publication and resolutions	
Wild foods.....	

Strawberries—

Discussion on	
Essay on, A. N. Wilcox	
Jessie	
Reports on	
Varieties recommended.....	

Stubbs, N. J.—

Grape growing.....	75
Report as vice president.....	247

T

The Farmer, extract from	449
--------------------------------	-----

Thompson, J. S. B.—

Delegate from Iowa.....	58
Remarks by	58, 111, 339

Transactions—

Amber Cane Association	129, 145
The Society.....	23, 96, 190, 293
Tree peddlers	69, 77, 215, 249

Tuttle, A. G., Russian orchard of.....	96
--	----

U

Underwood, J. M., remarks by.....	90, 94, 375
University farm Prof. E. D. Porter	372
Urle, Wm., remarks on apiculture	140

V

Van Cleve, Mrs. C. O., Arctic flowers.....	265
Van Deman, H. E., letters from.....	42, 215
Volume fifteen	211

W

Warren, C. H., letter from	162
Wedge, Clarence, forest protection	397
Wier, D. B., native plums and how to grow them.....	381
Wilcox, A. N., essay on strawberries and raspberries.....	310
Wilcox, B. T., essay on blackberries and dewberries	317
Wilder, M. P., referred to.....	191, 205
Wild food, Col. J. H. Stevens	193
Winter meeting.....	23
Wisconsin Horticultural Society.....	417
Woodruff, Philo, memorial	412

Y

Yellow Transparent.....	122, 461
Young, H. H., remarks by.....	375

**THIS BOOK IS DUE ON THE LAST DATE
STAMPED BELOW**

AN INITIAL FINE OF 25 CENTS

**WILL BE ASSESSED FOR FAILURE TO RETURN
THIS BOOK ON THE DATE DUE. THE PENALTY
WILL INCREASE TO 50 CENTS ON THE FOURTH
DAY AND TO \$1.00 ON THE SEVENTH DAY
OVERDUE.**

Book Slip-25m-7,'53 (A8998s4) 458

114629

SB21

Minnesota state horti-
cultural society.
Transactions.

M54

1886/87-

1887/88

Minnesota.

SB21

M54

1886/87 -

1887/88

114629

